The Association of Special Libraries and Information Bureaux

Report of Proceedings

of the

SEVENTH CONFERENCE

held at

New College, Oxford

SEPTEMBER 19th—22nd, 1930

THE OBJECTS OF THE ASSOCIATION ARE : To examine, foster, and co-ordinate the activities of special libraries, information bureaux, and similar services ; to act as a clearing-house for these services ; to develop the usefulness and efficiency of special libraries and information bureaux under whatever titles they may function ; and generally to promote, whether by conferences, meetings, or other means, the wider dissemination and the systematic use of published information.

The Association aims at assisting members who desire information of any kind to get into touch with the appropriate library or other body specializing on the subject ; it does not itself attempt to build up any centralized organization to provide the detailed information direct.

PUBLISHED BY THE ASSOCIATION OF SPECIAL LIBRARIES
AND INFORMATION BUREAUX
26, BEDFORD SQUARE, LONDON, W.C.1

1930

PRICE 5/-

Editorial Note.

THE papers that follow constitute a record of the proceedings of the Seventh Conference of the Association. Written papers were, as a rule, prepared in advance by the speakers, and these have been reprinted in full. No verbatim reports of the discussions were made, but, with the aid of notes taken by the Chairmen of the meetings and provided by the various contributors to the discussions, as full a report has been printed as the limitations of space permit. It should be noted that where contributions have been summarised because of this limitation any reader interested can see the full report at the ASLIB office. The editors take this opportunity to acknowledge their indebtedness to all those members of the Conference who have sent in notes of their contributions.

An index to the contents of the Report is printed at the end. Copies of the Reports of the six previous Conferences are still available, and the fifth Report contains an index to the first five.

During the week-end members of the Conference had opportunities to take part in conducted visits to the Radcliffe Observatory and the Library of the Imperial Forestry Institute. The thanks of the Association for these privileges, which were very much appreciated, are due to the authorities who provided the facilities and to those who conducted the parties.

26, Bedford Square,
London, W.C.1.

List of Visitors to the Seventh Conference.

1	H. W. Acomb, M.A.	National Liberal Club.
2	Miss H. Adair.	National Council for Animals' Welfare.
3	R. Olaf Anderson, B.A.	G. G. Harrap and Co., Ltd.
*4	E. W. Ashcroft.	"World Power."
*5	J. D. Athey.	Textile Institute.
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9	F. A. Bather, D.Sc., F.R.S.	
10	Theodore Besterman.	Society for Psychical Research.
11	W. Bonser, B.A., Ph.D., F.L.A.	University of Birmingham.
12	S. C. Bradford, D.Sc.	The Science Library.
13	Mrs. S. C. Bradford.	
14	A. Brammer.	Association of Supervising Electrical Engineers.
15	Mrs. A. Brammer.	
16	D. A. Bremner, O.B.E., M.I.Mech.E., M.I.E.E., M.I.M.M.	The British Engineers' Association.
17	R. Brightman, M.Sc., F.I.C.	British Dyestuffs Corporation, Ltd.
18	Mrs. R. Brightman.	
19	S. S. Bullock.	Association of Special Libraries and Information Bureaux.
20	Mrs. S. S. Bullock.	
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24	Major A. G. Church, D.S.O. M.C., B.Sc., M.P.	
25	Miss J. N. Combe.	Rothamsted Experimental Station.
*26	Dr. J. B. Condliffe.	Institute of Pacific Relations.
*27	J. J. Conlan.	"World Power."
28	Willard Connely.	American University Union.
29	W. L. Cooper.	Bristol University.
30	Mrs. W. L. Cooper.	
31	A. Cowley, M.A., D.Litt.	Bodleian Library.
32	B. C. Curling.	Institute of Marine Engineers.
33	R. W. Dana, O.B.E., M.A., M.Inst.C.E.	Institution of Naval Architects.
34	T. R. Dawson, M.Sc., F.I.C., F.I.R.I.	Research Association of British Rubber Manufacturers and Institution of the Rubber Industry.
35	Miss B. M. Dent, M.Sc.	Metropolitan-Vickers Electrical Co., Ltd.
36	Miss L. B. Dibben.	Ministry of Labour.
37	W. K. Dickson, LL.D.	The National Library of Scotland.
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40	F. Donker Duyvis.	Nederlandsch Instituut voor Documentatie en Registratuur.
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43	H. Farr.	City of Cardiff Public Libraries.
44	G. Ellis Flack, M.A.	University of Birmingham Research Committee.
45	Miss M. Fletcher, B.Sc.	
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*47	Miss Dr. Goedhuis.	Noury and van der Lande.
48	L. D. Goldsmith, B.Sc., F.I.C.	General Electric Company, Ltd. (Research Laboratories).
49	Miss M. B. Goodall.	The Gramophone Company, Ltd.
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51	Miss Muriel K. Grindrod.	Royal Institute of International Affairs.

52	Miss G. Guiney.	Imperial Forestry Institute.
*53	Professor W. K. Hancock.	Public Library, Museums, and National Gallery of Victoria.
54	Miss E. Handlen.	Agricultural Economics Research Institute.
55	R. Harman.	"Display."
56	B. M. Headicar, F.L.A.	London School of Economics and Political Science and the Joint Standing Committee on Library Co-operation.
57	F. Henn.	Imperial Institute.
58	Miss M. C. Hildyard, B.A., Ph.D.	Birkbeck College.
59	R. H. Hill.	Bodleian Library.
60	Miss W. Hill.	Royal Empire Society.
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125	Miss D. M. Pritchard.	Association of Special Libraries and Information Bureaux.
*126	A. Rees.	British Empire Film Institute.
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182	Dr. G. Freitag.	Deutscher Verband Technisch-Wissenschaftlicher Vereine.
183	C. H. Gray.	International Executive Council, World Power Conference.
184	Professor B. W. Holman.	Association of Scientific Workers.
185	Councillor C. R. Keene.	Leicester City Libraries.
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187	Mrs. H. G. Massingham.	Royal Society for the Prevention of Cruelty to Animals.
*188	W. M. Page.	
*189	Mrs. A. F. Ridley.	
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192	Miss M. K. White.	The Northern Polytechnic.
193	Mrs. M. de Wolff.	
194	Professor Myres, O.B.E., M.A., F.B.A.	
195	Laura A. Thompson.	U.S. Department of Labor, Washington.
196	Mrs. A. P. Thurston.	

* *Prevented from attending.*

Contents.

FRIDAY, September 19th. PAGE

RECEPTION OF DELEGATES by the Council of the Association and DINNER. Address by the President-elect (Mr. H. T. Tizard, C.B., F.R.S.) 13

GENERAL SESSION.

Chairman: MR. H. T. TIZARD, C.B., F.R.S.

The Year's Work of the Association.

BRIGADIER-GENERAL MAGNUS MOWAT, C.B.E., M.Inst.C.E., M.I.Mech.E. 15

SATURDAY, September 20th.

SECTIONAL MEETINGS.

(*A*) Chairman: The RIGHT HON. BARON OLIVIER, P.C., K.C.M.G., C.B.

The Dissemination of Information by Exhibition and Display.

COLONEL SIR HENRY G. LYONS, D.Sc., F.R.S. . 24

MR. F. A. BATHER, F.R.S. 27

MR. J. M. WALKER (Belmont Publicity) . . 30

(*B*) Chairman: PROFESSOR GILBERT MURRAY.

Animal Welfare, its Dependence on Accurate Information.

CAPTAIN C. W. HUME, M.C., B.Sc. . . . 31

(*C*) Chairman: COLONEL SIR FREDERICK NATHAN.

The Inadequacy of the Alphabetical Subject Index.

PROFESSOR A. F. C. POLLARD, A.R.C.S., F.I.P., AND DR. S. C. BRADFORD 39

PAGE

FIFTH ANNUAL GENERAL MEETING . . 99

GENERAL SESSION.

Chairman: Mr. C. A. Spencer, M.Sc.

The World Power Conference.

Mr. D. A. Bremner, O.B.E., M.I.Mech.E., M.I.E.E. . 55

SUNDAY, September 21st.

SECTIONAL MEETINGS.

(*A*) Chairman: Dr. Raymond Unwin, F.R.I.B.A.

Surveys and Planning, their Relation to Organised Information.

Mr. G. L. Pepler, F.S.I. (Past President, Town Planning Inst.) 57

Mr. L. C. Marsh, B.Sc. (The New Survey of London Life and Labour) 64

Mr. C. C. Fagg, F.G.S. (Leplay House) . . 71

(*B*) Chairman: Major A. G. Church, D.S.O., M.C., B.Sc., M.P.

The Technique of Information in the Training of Students.

Mr. G. F. O'Riordan, B.Sc., M.I.Mech.E. (Principal of Battersea Polytechnic) 77

Mr. B. M. Headicar (Librarian, London School of Economics) 84

(*C*) Chairman: Mr. L. D. Goldsmith, B.Sc., F.I.C.

Suggestions for the Improvement of Scientific Literature.

Mr. T. W. MacAlpine 86

GENERAL SESSION.

Chairman: Dr. R. S. Hutton.

(1) **The Organisation of Information in Germany.**

Herr Alfred Schlomann 90

Dr. Prinzhorn 94

(2) Resolutions 98

Votes of Thanks 98

Accounts for the Year ending June 30th, 1930 . . 101

ASLIB and its work.

Col. Sir Frederick Nathan 103

Report on Universal Decimal Classification . 110

Index 112

Reception and Opening Dinner.

Delegates were received before dinner by Mr. H. T. Tizard and the Council of the Association. After dinner Mr. Tizard addressed them. He said :

My first duty is to thank you for the honour of election as your President for the coming year ; an honor which is all the greater for the reflected glory of my distinguished predecessor, whose shoes you will not, without disappointment, expect me to fill. Like him, I am a little embarrassed by the scope of your activities if one may judge superficially from the proceedings at your annual conferences. Last year you discussed the Preservation of Places of Natural Beauty, as well as some problems of the education of children : this year we are to discuss surveys and planning and animal welfare. It is natural at conferences such as these to discuss particular matters of common interest in such a way as to illustrate the value of, and the need for the work of, the Association, but I hope this does not go so far as to obscure from the public the chief aim of the Association to develop methods by which people can get access to any existing sources of information more expeditiously and more completely than they can at present. It is to this task that we must direct our energies ; a task which has not been taken up a moment too soon. It is 150 years since Dr. Johnson wrote : " It is indeed culpable to load libraries with superfluous books." Since then at least ten million separate works, most of them apparently superfluous, have been added to the world's collection, and at the present rate of progress it will not take fifty years to add another ten million. I wonder what Dr. Johnson would say if he could step inside the Bodleian Library to-day and have a chat with Dr. Cowley about his difficulties. Or what he would do if he was asked to indicate the superfluous works. I don't feel he would have much difficulty in deciding on the destruction of most modern novels ; but when it came to works which purport to contain useful information I think even Dr. Johnson might have doubts as to his own judgment. Most readers of the Journal of the Chemical Society, for example, would agree off hand that nine-tenths of its contents were superfluous ; but if you asked every fellow of the Society to indicate which tenth he would like to keep you would probably get a diversity of opinion so great as merely to endorse the wisdom of the Publication Committee in retaining the whole. Even the greatest society of the world has known the experience—I might say the shame—of rejecting a contribution to knowledge, the only fault of which was that it was too many years ahead of the accepted doctrine of the time. Few societies which exist for the dissemination of knowledge can afford to take the risk of rejecting, on the advice of a few people, a contribution which contains, so far as can be ascertained, something new, and is made in good faith. We must make up our minds that the volume of recorded knowledge will continue to swell at an ever-increasing rate, and address ourselves more eagerly than we have in the past to making better use of it. This is much easier said than done. Most people who want information quickly on any given subject will consult the better-known authorities and the most easily-available publications, and leave the rest alone, feeling that life is too short to go digging almost at random into a mass of literature that may or may not be useful for their purpose. To do so, we might say, would be like looking for a needle in a haystack without any real indication that the needle is there. From this saying we can, I think, derive a lesson of some hope to the Association. The difficulty of finding a needle in a haystack is proverbial, but the proverb is now quite out of date. A modern physicist, equipped with the necessary apparatus, would find no difficulty whatever in recovering a needle from a haystack with the least possible disturbance to the hay. So, too, we need not despair of eventually devising a simple method of locating any given kind of information in a stack of apparently irrelevant literature. The first essentials are expert librarians and a complete system of indexing and cross-reference. Having listened to conversation on the subject, I am quite ready to believe that there are nine and twenty ways of indexing and that every single one of them is as near right as can be. But for practical purposes the world does not really want more than one general system, and it is high time that there was international agreement on the subject. The paper by Professor Pollard and Dr. Bradford, to be presented during the conference, shows in a vivid way some of the results of the present chaotic methods.

During recent years I have been closely in touch with the development of industrial research by the state and by private enterprise. No one who has been in such a position can have failed to realise that the proper use of existing scientific knowledge and the steady influx into industry of people capable of using it is of equal, if not temporarily of greater, practical importance than the extension of knowledge. In pessimistic moods one is even tempted to ask oneself what is the good of the State piling up technical information for the chief benefit of foreign competitors who are on the lookout for it and know how to use it quickly. Every man at the head of an industrial research organisation knows the importance of building up an information bureau side by side with his laboratories. In a recent number of the ASLIB Bulletin Mr. Vincent Garrett gives an interesting account of the use that is made of the library of Messrs. Rowntree and Company. I fancy you would find his experience confirmed by the librarians of many other firms; indeed, in my wanderings the only criticism I have ever heard made by a director of increased expenditure in libraries is that librarians, being in many cases attractive young women, tend to leave their occupations to become indispensable to a single individual as soon as they have learnt to become indispensable to the firm. But if this is the welcome attitude of the larger organisations which can afford to maintain their own research laboratories and specialised bureaux of information, what is the position of the smaller firms which cannot? Rationalisation of industry is still taken by many people to be synonymous with the absorption of many small concerns by a few large organisations. If that horrid word implies broadly a conscious effort to pursue greater efficiency of production and distribution, the small concerns will go on existing, in this country, at any rate. There are some things which can only be produced and distributed efficiently on a very large scale: there are others which lend themselves better to scattered production on the small scale. The difficulty which small producing companies are confronted with is that of keeping up-to-date without a disproportionate expenditure. It is vital that they should co-operate somehow both in the acquisition of new knowledge and in the application of existing knowledge. In national as well as in international affairs co-operation is perfectly compatible with independence, and is the ultimate key of industrial progress. From this point of view your annual report does not altogether make pleasant reading. I notice in the list of members many large firms of repute, but few, if any, of the small concerns which ought to profit relatively most from your work. I hope it will be possible to make some further effort to make the work of the Association more widely known. Perhaps the circulation of Sir Frederic Nathan's recent paper to the Zurich conference to all constituent members of Industrial Research Associations would be a useful and economical first step.

With these few words I will conclude by thanking you again for your welcome. In spite of temporary difficulties, the Association will be well advised to go forward courageously, conscious that all pioneers have serious difficulties, and that the work you have set yourselves to do is of real value to the nation.

The Year's Work of ASLIB.

By BRIGADIER-GENERAL MAGNUS MOWAT,
C.B.E., M.Inst.C.E., M.I.Mech.E.

It will be appropriate to open this report by referring to our present meeting-place. During the conferences held here in 1928, there was an unanimous expression of opinion by the delegates in favour of either Oxford or Cambridge as the place for ASLIB's meetings. Last year at Trinity College, however, there was a decision asking the Council to take Bristol into consideration as a possible place. Accordingly the Secretary visited Bristol, where he was assisted by our friend Mr. W. L. Cooper. He found that, great as were the attractions in many ways, the available accommodation for meetings and residence was so scattered as to be a considerable inconvenience. In deciding upon Oxford, therefore, the Council felt that they were consulting the best interests of the delegates and falling in with the wishes of the majority of members. They believe that the success of earlier conferences has been due, not a little, to the atmosphere provided in Oxford and Cambridge, in which the meetings have taken place, and that to have secured New College again is a matter for congratulation.

Finance and Membership.

The annual accounts of the Association have been circulated and they will be before the members at the Annual General Meeting, so I need not refer to them here in detail. The outstanding fact which they show is a difference, on the wrong side, between the income and expenditure of the Association for the year, with a consequent reduction of the reserve funds. In other words, there has been no increase of membership subscriptions to make good the loss of grants from the Carnegie United Kingdom Trust, which have come to an end. That is not to say that there has been no increase of membership; about forty new members have joined, but this addition has been offset by resignations due, in the main, to two causes, the ordinary losses which are to be expected each year, amalgamations, deaths, removals abroad, etc., and exceptional losses due to curtailment of expenditure on account of the present depression in industry.

There is no doubt that this is the chief obstacle in the way of the recruitment of new members. Probably no one here believes that it is a true economy to refrain from paying a subscription to become a member of ASLIB, but too often an effort to be economical consists of a simple, arbitrary decision to incur no new expenditure whatsoever.

These facts have to be stated and it must be admitted that they are not what one would like best to be able to report. But I want to say, most emphatically, that anyone who is discouraged by them is, in my opinion, making a great mistake. That is the view which I share with the whole of the Council, who are not in the least despondent about the future of the Association. This is a situation in which bare figures are misleading. The true statement of the position is that ASLIB is a young organisation which quickly built up a membership,

satisfactory in quantity, having regard to the few years of its existence, and very fine indeed in quality. That membership has been maintained steadily in spite of the great difficulties of the times. The Association has accomplished a great deal; its conferences are increasingly successful, its activities are growing and its influence is increasing. I believe that there are not a great many institutions in the country of which as much could be said at the present time.

The Immediate Future.

Revision of expenditure, pending an increase of membership, is unavoidable, and the Council are considering proposals with a view to effecting this with as little curtailment as possible of the Association's activities. At the same time they are surveying again all possible means of drawing attention to the objects and work of the Association and of gaining support for them. In this they are giving special attention to a problem which has always confronted them. A statement of the objects of ASLIB and the services which it can render must be brief if it is to be read, but brevity means generalisation. The implications of a phrase such as " the systematic organisation of information " may be clear enough to us, but it is very doubtful whether the secretary, or research worker, or business man who reads it realises its many applications to his own work. For his benefit the phrase needs expansion and illustration, and the appropriate illustration varies according to the work of the man whose interest is sought. With that in mind the printed leaflets of the Association are being revised.

The same difficulty, to overcome which involves almost individual approach to prospective members, has turned the attention of the Council to the possibility of establishing local branches of ASLIB. The fact that a big proportion of national organisations have their headquarters in London accounts for the fact that a majority of our members are there, but the absence or smallness of membership in great provincial towns is rather striking. It is suggested that branch organisations might remedy this by stimulating local interest in ways which cannot easily be undertaken from Bedford Square, and that they could, by bringing members in each locality more into contact with one another, increase the value of the Association's work both for the local members concerned and generally.

Nothing very formal would be required. Suppose that groups of members in convenient areas met four times a year to discuss the Association's work and their own needs in relation to it. The successive issues of " ASLIB Information," containing current information regarding the Association's activities, could be used as a kind of agenda. It is certain that the conversation at such meetings would reveal ways and means in which local members could help each other, in which the group could help the Association's work, and in which the Association could help its members in the district.

In carrying out such a scheme the Council would be dependent upon the willingness of members in provincial centres to undertake the small amount of work involved in arranging meetings and acting

as correspondents with the head office. I hope that some volunteers may be forthcoming from those present.

The Library Association.

Members are aware that the idea of an amalgamation of ASLIB with the Library Association has been mooted more than once since ASLIB was established. The Carnegie United Kingdom Trustees have not concealed the fact that they would have welcomed such a conjunction, and no reason other than respect for the wishes of the Trustees would have been necessary to ensure that the Council would give full consideration to the possibility. They have always been anxious to maintain a close relationship with the Library Association, amongst other bodies, with a view to co-operation in regard to any matter of common interest. Informal meetings, convened by the Trustees, have taken place between representatives of the two organisations, and a stage was reached at which the Library Association submitted proposals embodying their idea of the lines upon which amalgamation might take place. A close study of these proposals, together with a careful examination which had already been made of the objects and constitutions of the two bodies, confirmed the conviction of the Council that the interests of ASLIB and its work would suffer seriously if it lost its independence. They became aware also that the knowledge that conversations were taking place was having harmful reactions, and they therefore informed the Trustees of their decision to discontinue the negotiations.

The ASLIB Directory.

As was to be expected, the sales of the Directory, more than two years after publication, are now small. The Directory appeared in May, 1928, and by the end of June in that year, 1,079 copies had been disposed of, 722 distributed free to members and to public libraries, and 357 sold. During the following year, the number sold was 126, and in the year 1929–30 the figure was 97.

When Miss Warren left the service of the Association after last year's Conference, Miss Walton was engaged as half-time assistant and nearly the whole of her time has been devoted to work in connection with the Directory, and, as the result, it has been possible to keep the records well up to date. From time to time, as space permits, amendments and additions to the Directory are published in "ASLIB Information" for the benefit of members and, of course, the supplementary information gathered is used in dealing with members' enquiries.

Enquiry Bureau.

Dealing with members' enquiries continues to be an important part of the routine work of the staff. The incidence of the work is irregular. For some days no enquiries may come in; at other times several reach the office daily. And, whilst some can be answered out of hand, others involve correspondence and research. Within the limits of the time at the disposal of the staff the latter are welcomed, as the search for information required not infrequently brings to light a new source of information and, to that extent, improves the Association's records.

A certain number of members make use of the Enquiry Bureau quite often, but the proportion which ever employs this service is small as compared with the whole membership. The probability is that a great number of members fail to think of ASLIB when they are in difficulty about some piece of information. Indeed, there is evidence that that is the case. This is a fact which must be regarded with mixed feelings. If every member resorted frequently to the Bureau the staff would have difficulty to cope with the work. On the other hand, it is unsatisfactory to know that full use is not made of a service provided by the Association for its members.

" ASLIB Information."

The experiment of publishing a quarterly bulletin for members has been continued, and No. 5 is now in their hands. The usefulness of such a periodical, as a means of conveying information and Association's news, has fully justified the publication, which now can be said to have passed out of the experimental stage. There is negative evidence, however, that in some cases " ASLIB Information " is filed away unread, and I wish to take this opportunity to repeat an appeal which has been made already in the Bulletin. The Bulletin is designed to provide a means of regular communication between officers of the Association and members. Matters, which hitherto have been the subject of special circular letters to the membership and which are of importance if members are to take advantage of their Association, are dealt with in " ASLIB Information." It is essential, therefore, that members should look through each issue and give as much attention to any announcements and requests as though they were contained in a personal letter from the Secretary. " ASLIB Information " is published at quarterly intervals only, and the time needed to glance through its contents and to take necessary action on the few occasions when that is called for is little.

The Panel of Expert Translators.

Full details concerning the establishment of the Panel of Translators have been printed in " ASLIB Information," and a leaflet describing the scheme has been sent to every member, so I need not repeat these particulars. The scheme was announced publicly by means of a letter which Sir J. J. Thomson addressed to the daily, scientific, and technical papers, and to societies, institutions, etc., likely to be interested. As the result a great number of enquiries were received from prospective translators and users. So far no other steps have been taken to advertise the Panel, but it is proposed, now that the holiday season is over, to insert advertisements in suitable journals. Something over a hundred translators have sent in the questionnaire, which applicants are required to answer, and the work of examining their qualifications and of registration is proceeding. The need now is to make the service available known as widely as possible amongst those who from time to time require the services of an expert translator. This is a matter in which members who are willing can give assistance by informing the members of their own organisations of the Panel, by announcements in their journals, or by distributing the Association's special leaflet.

ASLIB and Classification.

The magnitude of the existing and rapidly-increasing mass of recorded information necessitates the provision of means by which it can be made readily available to workers in every intellectual field. Scarcely a day passes when the needs of members, in collecting, arranging, and exchanging special information, are not brought to the attention of the Association, and for this reason the Council decided to appoint a Committee to consider classification as an instrument to be used to facilitate this work.

This Committee's report, which was signed by Brigadier-General Magnus Mowat, Dr. R. S. Hutton, Miss A. L. Lawrence, Sir Frederic Nathan, Mr. B. M. Headicar, Mr. L. Honeyburn, Dr. S. C. Bradford, Colonel L. Newcombe, and Mr. A. F. Ridley, was printed in full in "ASLIB Information." In the introductory paragraph the Committee said:

> In asking us to consider the subject of classification and to prepare a report, the Council of the Association had in mind particularly the uses of classification in connection with the maintenance and exchange of records of specialised information, and it is this aspect which has been chiefly in our minds when considering the matter. We present below the conclusions which we have reached.
>
> At its Conferences ASLIB has provided a platform for the discussion of classification systems, and their applications, and from time to time its Enquiry Bureau has been called upon to advise and assist members with regard to their problems of classification, but the Association, as a body, has not advocated the adoption of any particular system. We think that the time has come for the Association to abandon this detached attitude and to include amongst its definite objects the realisation of uniformity in bibliographical methods. The assumption of a positive attitude in regard to this matter will give point and vitality to much of its work and indicate definite lines of action in several matters to which only desultory attention has been given hitherto. The pursuit of uniformity inevitably involves that ASLIB must become the advocate of a particular classification system.
>
> We are ready to admit that none of the existing classification systems is perfect, that each has special qualities and defects, and in proposing that the Association should adopt the Universal Decimal Classification of the Institut International de Bibliographie we are fully aware of the justice of certain criticisms made against it. But for certain reasons we think that this system is the best.

The report proceeds to give these reasons, of a technical character, in detail and to make proposals for lines of action. The Council adopted the report and, as a first step towards putting its recommendations into effect, appointed Sir Frederic Nathan and Colonel Newcombe to represent ASLIB on a joint committee with the British Society of International Bibliography. The British Society appointed Dr. Bradford and Professor Pollard to be their representatives and a preliminary meeting of the joint committee has taken place.

The Training of Special Librarians.

At the last Annual Conference Mr. Ridley read a paper on this subject and, as the result, a resolution was passed asking the School of Librarianship to consider the provision of a one year's intensive course for special librarians, and I think that ASLIB is to be congratulated upon the success of its efforts in this direction. A scheme was prepared for an alternative course for the University Diploma of Librarianship, and this was passed by the Senate. Graduates in faculties other than

Arts will be admitted to this course, and will be exempted in certain subjects, on the same terms as those now enjoyed by the holders of Arts degrees. Thus a knowledge of German can now be offered instead of Latin, and various alternatives can be taken more suited to the needs of special librarians.

For Library Organisation and Library Routine a course in the fundamentals of Library Economy may be taken; instead of Palæography and Archives, the History of Science; and a new subject, Special Library Services, has been introduced covering the new features on which Mr. Ridley laid special stress.

The Council regard these new facilities as a matter of first-rate importance, believing that there is no more certain way of achieving the objects of the Association than by securing that posts in special libraries and information bureaux are filled by properly-trained men and women. They are doing everything they can to obtain support for the School of Librarianship in this departure, and they hope that every member of the Association will do as much.

Education for Salesmanship.

A resolution passed at the 1929 Conference called upon the Council of the Association to prepare and offer evidence before the Board of Education Committee on Education for Salesmanship. It was found, upon enquiry, that oral evidence was not being taken by the Committee, but the Association was asked to submit a written memorandum of its views. Accordingly the Council appointed a sub-committee to prepare this memorandum, which can be seen at the office of the Association. The points stressed were that salesmanship required a great variety of specialised knowledge of goods, markets, languages, customers, and so forth beyond the power of the individual to acquire. To be efficient in his work the salesman must therefore depend upon a subsidiary service of information which can be provided only by specialists trained in the technique of information work. Such a service means the establishment of suitable information bureaux with trained personnel.

The National Central Library.

It must be a source of much gratification to members that this new title of the Central Library for Students can now be used, with all which that implies. ASLIB has always been active and has done what it could to secure a national status and a government grant for this most important bibliographical service. Acting upon the recommendations of the Public Libraries Committee, before which ASLIB gave evidence, and of the Royal Commission on National Museums, the Treasury, in February, passed for the estimates for 1930 a grant of £3,000 and the library has been re-constituted with its new title. This re-construction, which was a condition of the Treasury grant, provides, amongst other things, for an executive committee of not more than eighteen members of which one may be appointed by the Council of ASLIB. I have the honour to be ASLIB's first representative on this committee. The development of the Library's work, made possible by Government assistance, will be watched with great interest.

The Union Catalogue of London Libraries.

Many of the activities of the Association are of a kind which do not produce immediate tangible results, and results for which ASLIB has been responsible are not always associated with it when they appear. It is all the more gratifying when credit is given where it is due. Speaking at the Library Association Conference at Brighton, Colonel Newcombe said: "The Union Catalogue of the London borough libraries and the Guildhall Library, on which work is to be started in the autumn, owes its origin to a large extent to the Association of Special Libraries and Information Bureaux, at whose conferences it has been discussed and whose resolution and backing have done much to convince those whose help was needed that the compilation of such a catalogue would be an invaluable bibliographical tool to students, not merely in London, but throughout the country." The work of compilation is proceeding at the National Central Library.

Durability of Paper.

The Committee which was set up by the Library Association as the result of resolutions passed at the ASLIB and L.A. Conferences in 1928 are approaching the end of labours which have proved to be unexpectedly arduous. Mr. Bullock has represented ASLIB on the Committee, of which many meetings have been held during the past eighteen months. Their report will be published shortly, when it will be seen that not the least important result of their work is to have established the fact that papers, of specification approved from the point of view of durability, can be manufactured and sold at commercial prices. The problem resolves itself very largely into one of educating users of paper. The Committee will have recommendations to make in their report which, it is hoped, members of ASLIB will assist in carrying out.

The Page Size of Journals.

The report of the year's work of the Association given at the last Annual Conference, referred to the Council's activities in regard to securing uniformity of page size in journals, and stated that negotiations taking place between advertisers and publishers might lead to satisfactory results. This has been borne out by resolutions passed at a meeting of a joint Committee of the Incorporated Society of British Advertisers and the Periodical Trade Press and Weekly Newspaper Proprietors' Association (both members of ASLIB). The resolutions confirm the principle of the standardisation of advertisement net space page size for all trade and technical journals; recommend the adoption of 10in. by 7in. as the accepted standard, with 11½in. by 8in. and 9in. by 6¼in. as alternatives where deviation is necessary. It is reported that a number of journals, including "Transport Management," "Good Roads," "The Model Engineer," "Mechanical World," "Quarry Managers' Journal," "Shoe and Leather News," and "Electric Railway, Bus and Tram Journal," have altered their sizes in conformity with the resolution and that many other papers are preparing to make the change.

Publishers' Catalogues.

The following resolution was passed at the 1929 Conference of the Association at Cambridge :

That this Conference would like to draw the attention of those responsible to the inadequate bibliographical details given in the majority of publishers' catalogues. The minimum information which should be supplied is : Author, title, editor, and, or, translator (if any), date, illustrations (if any), number of pages, binding, edition or impression, size and price. In addition the Conference deplores the common mis-use of the terms "Reprint," "impression," and "edition." They would suggest that much confusion would be avoided and much time saved if the precise meaning of these terms were strictly adhered to by all concerned.

The Council have been in communication with the Publishers' Association in regard to this matter, and it has been the subject of informal discussion with individual publishers. Although the Publishers' Association is not primarily concerned with matters of this kind, the subject of the resolution has in part been considered by a joint committee of the Publishers' Association and the Associated Booksellers. Many members of ASLIB will be interested in the following recommendations of the joint committee :

(1) That the title page of every book should bear the date of the year of publication ; *i.e.*, of the year in which the impression, or the re-issue, of which it forms a part, was first put on the market.
(2) That when stock is re-issued in a new form, the title page should bear the date of the new issue, and each copy should be described as a "re-issue," either on the title page or in a bibliographical note.
(3) That the date at which a book was last revised should be indicated either on the title page or in a bibliographical note.

They recommend the adoption of the following definitions :

Impression.—A number of copies printed at any one time. When a book is reprinted without change it should be called a new impression, to distinguish it from an edition as defined below.
Edition.—An impression in which the matter has undergone some change, or for which the type has been re-set.
Re-Issue.—A re-publication at a different price, or in a different form, of part of an impression which has already been placed on the market.

The Publishers' Association have no power to enforce these recommendations upon publishers generally, and do not desire to exercise any such power. It would seem that the way of reform is for book purchasers to lose no opportunity of impressing upon booksellers and publishers their dissatisfaction in cases where books and announcements of books are defective in regard to bibliographical information.

Zurich Conference.

Earlier in the year the Council received an invitation for a representative to present a paper at the Conference of the International Institute of Bibliography which was held at Zurich in August. They were most fortunate in that Colonel Sir Frederic Nathan was attending the Conference and he agreed to speak on "The Association of Special Libraries and Information Bureaux and its work." Sir Frederic's paper gives a most interesting survey of the establishment

and development of ASLIB, and it can be seen at the Association's offices.*

Conclusion.

I think that I have mentioned all those parts of the year's activities which, because of compactness and completeness, are capable of individual reference. Those who are in constant touch with the office know that there is a great deal else which can be spoken of in general terms only. We are concerned with the systematic collection and use and dissemination of all kinds of specialised information, believing that every serious purpose depends upon organised information. That is not an original definition of ASLIB, but it bears repetition. In correspondence with members and others, in interviews, in the work of committees, that idea, of the necessity for organised information in every field of activity, is continuously applied. A permanent sub-committee of the Council is in being, whose business it is to survey the activities of the Association constantly. New material is always being gathered and suggestions for useful lines of action being considered. In a year's time there will be further progress to report in regard to some of the many matters which concern the Association.

The New President.

The election of the President of the Association for the year 1930–31 is a matter which is dealt with formally elsewhere, but I cannot conclude this report without expressing my own and the Council's great gratification that they have secured the consent of Mr. H. T. Tizard to accept their nomination for that office. Mr. Tizard's work as permanent Secretary of the Department of Scientific and Industrial Research is well known to the majority of members. He is now Rector of the Imperial College of Science and Technology, and I think there is significance in the fact that a man who had held these two positions is anxious to be associated closely with ASLIB. ASLIB is certainly most fortunate to have enlisted his interest.

DISCUSSION.

A short discussion took place on several aspects of the Association's work, to which contributions were made by Dr. E. A. Baker, Mr. E. A. Martin, Mr. B. M. Headicar, Mr. J. McAdam, Mr. J. M. Walker, Sir James Douglas, Mr. H. T. Tizard, Dr. R. S. Hutton, Mr. H. Rottenburg, and Mr. H. G. Riddle.

* Reprinted in this Report.

The Display of Scientific and Technical Objects.

By COLONEL SIR HENRY LYONS.

The effective display of exhibits consisting of scientific apparatus or technical objects presents many difficulties. While those which fall within the field of art are usually attractive in themselves to a greater or less degree, this will hardly ever be the cause with those classes which I am now considering. They are probably of extreme interest, but whether they arouse in the minds of those who see them all the interest that they might, will depend on these visitors having sufficient technical knowledge to appreciate their importance, or the extent to which they constitute a material advance on others of similar character. If this knowledge is lacking wholly or in part, then the exhibitor must do what he can to make it good; and so it comes about that the display of these classes of exhibits means not only that they must be shown to the best advantage, but also that so much information about each of them must be given as will enable those who are likely to visit them to understand enough about them to be interested and to appreciate their importance.

This provision of information for those who are familiar with the type of object shown, who know the essential characteristics of them, and who appreciate the essential points in which improvements are being made, is not usually a difficult matter.

Highly technical descriptions can be employed; little need be said about the earlier types from which those shown have been developed; essential points alone need be emphasised. This state of things is found at the meetings of scientific and technical Societies and Institutions where the appeal is to an expert and highly specialised audience.

But in proportion as the specialised knowledge of the visitor diminishes, so do the difficulties of the exhibitor increase.

At the other end of the scale may be placed those public museums which show objects of these kinds, and especially those in which no charge is made for admission; for here will be found not only those who possess full technical knowledge but others also who are far less effectively equipped for studying, or even for being interested in an exhibition of this kind.

Taking the Science Museum at South Kensington as an example, the visitors include members of the general public, many of whom can have only the most elementary knowledge of the principles underlying much that is shown there or even of the manner in which they operate, or the purposes which they serve with greater efficiency or economy than did the earlier types.

Here, too, come large numbers, perhaps as many as 150,000 annually, of quite young people who are interested in the few models or other objects which are familiar to them or which they can understand, or those which may appeal for other reasons. Even now, under very unfavourable conditions, they do gain a great deal of information, but as soon as the juvenile gallery now in preparation is ready, objects will be presented to them there in such a way as to be intelligible to them as well as being attractive to them.

Then there are the students and those occupied in professional work; for them full technical information, good lighting, suitable grouping near to earlier types are of special importance.

With care and forethought, however, it is quite possible to convey a large amount of information to those who visit a Museum, even though their technical knowledge may not be extensive, if objects are attractively shown, if too much information is not pressed upon them, and if their comfort during the very tiring task of visiting the Museum is considered.

The first point to which attention must be paid has already been mentioned, the objects are probably not attractive in themselves; information must be readily accessible, both for the general visitor and for those who have expert knowledge.

The key-note of the whole is development, so that the newest types should, if possible, be shown in series with some, at least, of the earlier ones, so that the kind, the amount, and the general trend of improvement can be appreciated.

Thus it comes about that in Museums, collections and exhibits which illustrate this kind of knowledge, the old and the new, the past and the present should, whenever possible, be represented, since the one supplements the other and their association goes far to tell the whole story. In the Science Museum the inclusion of examples from the earliest civilisations and from those of primitive races has helped largely to a full appreciation of the road that development has followed.

And this is not so difficult to arrange as it may seem to be; the technical object is not usually the creative conception of an artist as is the work of a sculptor or a painter. It is usually the work of an artisan more or less skilled who is aiming at producing something more efficient than has hitherto been available; consequently, accurate copies of earlier types are quite satisfactory in cases where an original example is unobtainable. In this way copies of Galileo's telescopes, Sir Isaac Newton's reflecting telescope, water-clocks of Ancient Egypt, and many similar cases are utilised in the Science Museum to complete the story of development when no originals can be shown.

This bringing together of different stages of development makes it especially necessary to display the more important objects so that they will be recognised at once by the visitor as being those to which he should direct his attention.

This may be done by placing them in a prominent position as compared with neighbouring objects. Showing a model or a machine in motion, or so arranging it that it can be operated by the visitor, attracts attention to it, even more effectively, and has at the same time the advantage of demonstrating the method of working, and showing parts which would not otherwise be brought into view. No means of attracting attention is more effective than this, but it is, of course, more suited to a permanent Museum than to a temporary exhibition.

A great deal can be done by suitable illumination, and over and above good lighting in exhibition galleries, special lighting inside the cases to show up particular objects is usually well worth undertaking.

In the same way illuminated photographic transparencies make a much greater appeal to visitors than do ordinary photographs.

The importance of descriptive and explanatory labelling has been mentioned already, but really satisfactory results are very difficult to attain. There is so much to be said, and yet there is little use in expecting a visitor to read carefully more than about 400 words as a maximum.

Purely general descriptive matter can be printed in heavy type to distinguish it from the more technical matter, and this is of great assistance to members of the general public who wish to know what an object is, and why it is being shown; though they probably do not wish to go further and learn how it effects its purpose, and in what features its improvements lie.

Grouping objects of a related type together, is very useful in bringing out special steps in its development, and in such a group it is often practicable and desirable to emphasise small improvements which it is not possible to show in the main collection where the interval represented between the various objects must be longer if the collection is not to become hopelessly congested.

Full-size objects and large exhibits must often be included on account of their historical importance, but unless they can be shown in a large hall or some suitable place, they tend to dwarf the smaller models and exhibits in their neighbourhood, and to cause them to be overlooked or their real importance not appreciated. In the same way large wall diagrams may often be less effective than a greatly reduced detailed drawing of the same subject which the visitor can look at and study at ordinary reading distance.

At every point the psychology of the visitor has to be considered if he is to get the most out of his visit to see any objects whether they are in a large Museum or a temporary exhibition.

The study of any collection of objects is very tiring; it demands close attention, the acquisition of new knowledge: it may necessitate standing in a constrained position while examining the various objects; the number of exhibits, their comparison and the selection of those which will repay fuller study; all these efforts make a visit a tiring experience, and therefore the comfort of the visitor must be studied.

Adequate lighting is probably the most important item, and next comes the convenient arrangement of objects so that, for example, those in front do not interfere with a clear view of those at the back of the case.

If smaller objects are placed in the lower portion of wall-cases near the floor, they are practically wasted, for visitors will not examine them, so that it is better to have wall-cases of reduced size beginning only at 2ft. 6in. from the floor.

Seating is rarely sufficient, and in a technical museum where technical visitors often take notes, stools for their use are a great amenity.

Anything that can be done to induce visitors to rest at intervals instead of trying to go through the whole series of collections at one visit greatly increases the benefit that they will gain from it. In the Science Museum demonstrations of electrically amplified gramophones and radio transmission by giving selections of music are found to be of great assistance in attaining this aim.

(2). Gleanings from the Experience of a Museum Curator.

By F. A. BATHER, M.A., D.Sc., F.R.S.

The main object of this discussion is to consider how information may be conveyed to a number of people by means other than words, whether spoken or written, and perhaps under "words" one may include sign-language. Possibly also for our present purpose graphic representation should be excluded, though to-day, as in the distant past, it is a favoured method of communicating both facts and ideas. At any rate, my particular contribution to the discussion aims at dealing with that method of instruction which is peculiarly the museum method—namely, conveying information by concrete objects. Essentially it is the arrangement and display of objects so that they may tell their own story. The term "visual education" has been used of late for some such method, but obviously is far from precise, since, literally construed, it includes the printed page, and it cannot possibly exclude pictures.

Whether it is really possible to manage without words or pictures altogether may be doubted. If possible, it would in these days scarcely be worth the trouble. A shopkeeper might stretch a piece of fabric across his window, fix a yard measure in front, and hang a half-a-crown from it. Few would fail to understand; but the words "Cheap line, 2s. 6d. per yard" would be more effective. Let us, then, avail ourselves when advisable of the label and the diagram or illustrative picture, remembering that the emphasis must be on the object rather than on any explanatory accessories.

A great museum man once said that a museum show-case with its labels should be like a text-book in which specimens took the place of illustrations. The conception in those days was novel and valuable, but is has been carried too far, and in many exhibits the specimens are unduly subordinated. We must concentrate on the object itself.

Remembering that museum objects are used, not as symbols, but as themselves, to convey some meaning either inherent in each, or consequent on some mutual relation between several, we must so display, arrange, and label them as to make the meaning evident to simple observation. The label, therefore, should be inductive, not deductive. Instead of a statement exemplified by a specimen, the statement must be inferred from the specimen.

The information to be conveyed may be either a statement of concrete fact, or some abstract idea. Between the two lie generalisations of fact. A simple fact of structure is easily conveyed by selecting a specimen that shows it clearly, mounting it so that the desired fact is given prominence, emphasising it by colour or by spotlight, as limelight is used on the stage, pointing to it with an arrow or leading the eye to it by a tape, and, if necessary, stating the precise fact on a label, which may be at the other end of the tape or pointer.

The fault in most such installations is that they try to tell too much at once; hence the labels are lengthy and the display confused. The ideal method is that each specimen should convey one fact, or conversely that only one statement should be conveyed at a time. A mammal is a warm-blooded vertebrate that has hair on the skin,

gives suck to its young, has two occipital condyles, and so forth. Each of these points should be shown by a separate specimen. Since, however, the value of each statement lies in its general character, it is advisable to indicate that by a series of specimens, choosing those which show the essential structure persisting under superficial diversity.

A good example of the method is provided by the series of human skulls arranged by Dr. Harrison in the Horniman Museum. In the laboratory a student with text-book beside him can handle a skull, and during several hours of hard work can gradually make out its numerous structures. In the museum any attempt to make a single skull in a glass case convey all that information would be futile. Dr. Harrison therefore uses a separate skull for each structural feature, so that the beholder's mind is not confused.

The presentation of more abstract ideas, such as classification, supposed genealogies, adaptation to environment, or Mendelian principles of inheritance, should follow similar lines. The facts should appear from the specimens, the relations of the facts from the arrangement of the specimens, and finally the obvious inference may be summed up in a label. We all believe in evolution, but proofs of it are difficult to come by. It is easy to arrange objects in apparent evolutionary series, but difficult to prove that the series represents a genuine line of descent. Let us, however, take certain fossil sea-urchins found in the chalk. We can first focus attention on a few special points of structure. Then we can show by photographs how the chalk lies in successive layers, the lower being presumably laid down before the upper. Then a large diagram will represent the whole succession of layers in their relative thicknesses, and on this diagram various series of sea-urchins may be placed, each specimen at the level from which it was collected, and each series devoted to the changes in one structural feature. Thus, with a minimum of words, it can be made obvious that the urchins passed in course of time through a continuous series of correlated changes, such that the latest forms near the top of the chalk are so different from their presumed ancestors near the bottom that they have to receive a different name. "Evolution" need not be mentioned, but a visitor who has examined such a series will have a better idea of the meaning of that word than many who use it far too glibly.

If longer explanatory labels are necessary, they should pass from the general to the particular, as a good player will do in the game called "Animal, Vegetable, or Mineral." When one has been discoursing learnedly for a quarter of an hour on some unfamiliar creature, it is a blow to one's pride to be asked: "Is it an animal or a plant?"

But the art of label writing scarcely lies within the scope of the present discussion. I must pass to a few details of exhibition.

Probably the most important condition is that the beholder should be able to inspect the object in comfort. He should have neither to strain his eyes and neck, nor to crouch on his knees, both of which defects were abundantly illustrated in the Geological Department of the British Museum during my Keepership. The average height of the adult human eye is five feet, the ordinary focal length twelve inches, and an easy forward bending from the hips will not bring

the eye more than fifteen inches in front of the perpendicular. Starting from these facts, B. I. Gilman estimates that the majority of museum specimens should not be placed lower than forty-two inches from the ground, or each higher than seventy-eight inches, that the depth of an upright case should not exceed twelve inches, and the breadth of a flat case eighteen inches. There are few museums in which these measurements are not greatly exceeded.

Taking those measurements, one notes that the maximum of comfortable vision is about half way between their extremes, and at that level should be placed the more important objects or the centre of attraction in an exhibit.

In hanging pictures it is the laudable custom to tilt those above the line, so that their plane surface is at right angles to the line of direct vision. This principle should be extended to large museum specimens of the appropriate shape, and to all labels. Slabs and labels above the line should have the top brought forward, those below the line should have the bottom brought forward.

The general level of a label attached to a specimen should be the same as that of the surface of the specimen, so as to avoid constant change of focus. If several objects are to be compared, they also should be at the same distance from the observer's eye.

The next most important condition of comfort lies in lighting. In a top-lit picture-gallery I always want to put up an umbrella. As Gilman says, " for good seeing it is more important that the eye should be sufficiently shaded than that the object should be abundantly lighted." It is becoming recognised by directors of picture-galleries that the spectator should be in a darker area than the pictures. This eliminates reflection from glazed pictures, but that is not its only merit. Even more important is the relief of the eyes from distracting glare.

This principle is one of the advantages of the method of installation that may be termed the Peep-Show. Of this there are many varieties. A single object may be placed in a box provided with a funnel-shaped opening through which it is viewed. The object is thus cut off from all distracting surroundings ; it is lit, not by the daylight or other external light, but by rays from electric bulbs concealed from the spectator by the slopes of the opening. The lamps can be placed and manipulated so as to throw up all the detail. At the other end of this series are the large naturalistic groups placed in alcoves screened from the general lighting, but themselves illuminated either by reflected daylight or by artificial light. Between the two come the small-scale panoramic models, such as those at the Imperial Institute. They bring out another advantage of the method—namely, the deception of scale. Such a model seen in the open is too obviously a miniature to be taken seriously ; but when cut off from the surroundings it gives its own scale and looks, as they say, " as large as life and twice as natural."

Mention of reflections reminds me that they can often be got rid of by sloping the front glass of the show-case, so that the rays are reflected to points below the spectator's eye. This has also the advantage that gallery dust does not settle on the glass.

We should all, no doubt, be happier if we could do without glass,

and the visitor would learn more if he could handle the specimens—if tactile methods of learning could be added to visual.

The principle of isolation exemplified in the Peep-Show is of universal application. A single object well displayed in its own case or even in a large shop front will have more effect than a multiplicity of objects. One need not always so as far as that, but let us recognise that nearly all our galleries and all our show-cases are too crowded. It is not enough to prevent one specimen from hiding another; it should not even break into the field of vision so far as to distract attention.

We trench here on the artistic side of exhibition work. Isolation and prominence of the important object must be combined with rhythm and harmony of the whole series. In this connection backgrounds have an added importance. They should not distract; that is granted. They should not unduly tire the eye as do some pure white backgrounds. They should not be funereal as dead black backgrounds (excellent in some cases) tend to be when too extensive. But beyond this they may be so chosen as to enhance the effect of the objects. May I remind you of the marvellous improvement at the Italian Exhibition when the liver-red wall at the end of the main room was covered with a yellow hanging?

Colour is often utilised in exhibits to bring out points of structure or to correlate facts. From this point of view the same colour should be used throughout for the same or similar facts. But the colours selected may also have an æsthetic value. A spot of bright colour can do more than give information; it can even make a dull exhibit look attractive.

There is room for far more harmony of design and beauty of colour in our museums of science—perhaps even in some of our museums of art—but too conscious a striving after what is called "artistic" is to be deprecated. The æsthetic element is valuable till it distracts attention to itself, or as, speaking within these walls, one may venture to quote: "Ars est celare artem."

DISCUSSION.

The meeting was opened by the CHAIRMAN (LORD OLIVIER), who gave a short address. After SIR HENRY LYONS and DR. BATHER had presented their papers, MR. J. M. WALKER, who had not prepared a paper, spoke on commercial aspects of display. A discussion followed, to which contributions were made by MR. E. A. MARTIN, MR. H. T. TIZARD, MR. H. ROTTENBURG, MR. B. M. HEADICAR, DR. R. S. HUTTON, MR. C. C. FAGG, MR. G. F. H. SMITH, MR. A. BRAMMER, and DR. A. P. THURSTON.

Animal Welfare: Its Dependence on Accurate Information.

By CAPTAIN C. W. HUME, M.C., B.Sc.

It is an aim of the Association of Special Libraries and Information Bureaux "to promote the wider dissemination and systematic use and collection of information." That aim is applicable with advantage in every department of our national life, but in no field of activity has it a more direct and vital application than in the protection of animals against unfair treatment.

Before considering this matter more particularly, however, it will be well to assure ourselves that the subject of animal protection is of serious practical importance, that, in fact, it deserves the attention of men and women who are already much occupied in scientific and other work of national value; for I have no wish to waste your time with fanatical propaganda or with nightmares bred of a hypersensitive fancy. You will pardon me, therefore, if I begin with a digression, by indicating briefly the kind of claims which the lower animals have on our attention and effort.

Fortunately, in addressing a British audience, it is safe to take for granted the ethical principles involved. More than a century has passed since the foundation of the Royal Society for the Prevention of Cruelty to Animals, and since the enactment, in the teeth of hilarious ridicule and of ministerial hostility, of the first Act of Parliament against cruelty. During that century we have done more than to put behind us the days when a man could be hanged for stealing five pounds, when slave-raiding was an honourable profession, and torture was recognised as an instrument of justice. For during that century the work of Charles Darwin has taught us to see the animal creation in a rational perspective, confounding for ever, let us hope, the narrow-minded anthropocentric prejudices of our forefathers. I do not think that many British citizens would nowadays endorse the conclusion reached in 1822 by the *Edinburgh Review*, to the effect that "no reason can be assigned for the interference of legislation in the protection of animals unless their protection be connected either directly or remotely with some advantage to man"! I shall, therefore, take it for granted that we have a duty to reduce as much as we can the sum-total of animal suffering. I shall assume, too, that an animal's claim to merciful treatment does not depend on its appearance or its utility. An old horse in a knacker's yard is less useful and less handsome than in the days of his prime, but he is entitled to a merciful end. The badger and the rat are less popular animals than the horse and the dog, but that does not justify the infliction upon them of avoidable suffering.

Kindness to animals has come, then, in the course of a single century,* to be a recognised principle of British civilisation. In practice, however, we have failed in important respects to give effect

* E. G. Fairholme and W. Pain, "A Century of Work for Animals" (Murray, 1924).

to that principle. A list of some of our shortcomings is given in a leaflet published by the University of London Animal Welfare Society and available at this meeting. May I specially mention four of them ?

The first consists in the current methods of trapping and destroying wild animals. It is easy to see what an ordinary gin is like, by spending a couple of shillings on a rabbit-trap at an ironmonger's, or by writing to a trap-manufacturer for his catalogue. With these instruments the leg of the captive is crushed by powerful steel jaws, and if such a tragedy were enacted for only a few minutes within sight and hearing of a public street, the perpetrator would certainly be roughly handled by the passers-by. Unfortunately, however, it is not a question of a few minutes ; trapped animals remain in the trap for periods which normally vary from a few hours up to a few days, according to circumstances, and many of them die in the traps of thirst, shock, and exhaustion. In Great Britain the law requires that traps of this kind shall be visited once between sunrise and sunset, but at Totnes recently a policeman found thirty-seven traps which admittedly had not been examined for fifty-four hours, and four of them contained rabbits which were dead and decomposed. The offender was fined £2. In unsettled regions, in the American continent and elsewhere, varying periods must elapse before a trap can be visited, particularly in rough weather.

We British are responsible for trapping in two ways. In the first place, London is one of the principal fur markets of the world, and the number of trapped furs auctioned there in a year can be estimated from the trade returns. In considering these we must eliminate the figures for domestic animals, and allow for the fact that about five or six per cent. of the American and Canadian furs are raised in farms. It is probably unnecessary to make any allowance for wild furs obtained by shooting or other humane methods : their number must be comparatively small. We thus find that in one year the furs auctioned in London alone numbered about twenty millions. The sum total of physical agony represented by this figure defies imagination.

I submit that the only remedy for this evil is that women, whose fashions in dress change so rapidly, should abandon the use of the furs of wild species. There are patriotic as well as humane reasons for their doing so. Warm coats are a necessity during the winter, and if women would wear British woollen coats instead of foreign furs, they would solve for us the problem of unemployment in the woollen industry.

It is stated that seals are ordinarily skinned alive : and this is one of the points on which precise statistical information would be very welcome.

Secondly, in addition to importing the furs of trapped animals, we trap a great many rabbits and other animals in Great Britain, chiefly by means of the steel-toothed trap or gin and the common snare. The trap crushes the limb, while the snare strangles the animal, the process being frequently a slow one. No precise information is available as to the number of rabbits trapped in Great Britain every year, but one of the largest wholesale poulterers recently guessed it as between thirty and forty millions. Since this figure amounts to

less than one per annum per head of the population, it probably is not exaggerated.

Rabbits must be destroyed, or they would destroy our agriculture. But humane methods* are available—the gate trap, the poacher's net (including an improved model recently invented by Mr. Collington), various spring snares (such as the Lewis and the Rabbitwist) which kill outright, the R.S.P.C.A. knotted snare which holds without strangling, and the Aucott trap, which needs improvement, but is probably sound in principle; and probably also Cookson's rabbit-trap. For small vermin we have the Lewis snare and Cookson's vermin-trap, which have been approved by the R.S.P.C.A.

All these humane methods are available, but in practice they are not used to any material extent: and it should be remembered that cats and dogs are very frequently caught and mutilated by the traps at present in use.

Several animal protection societies are concerning themselves with this problem, and call for our support. These include the R.S.P.C.A., the Scottish S.P.C.A., the National Council for Animals' Welfare, the Anti-Steel-Trap-League of Washington, U.S.A., a small Anti-Steel-Toothed-Trap Committee in London, and an energetic individual worker, Major Van der Byl, of Towcester.

For the destruction of animals which are not edible poison is often used. The poison most commonly adopted for rats and similar animals is barium carbonate. According to that invaluable authority, Mark Hovell,† this substance produces "purging and convulsive movements in the stomach, intestines, and kidneys. It probably causes severe abdominal pain. Death may occur, according to the amount of poison taken, within a few hours or from two to three days." Arsenic and phosphorus poisons are nearly as cruel. Strychnine and red squill, provided that the squill be of good quality and freshly prepared, are more humane, but need to be used with caution. Viruses are definitely condemned on several grounds by this authority. Varnish traps kill in the course of some hours, probably by suffocation: they are therefore inhumane.

Humane methods of killing rats are available, but involve slightly more trouble than the others, and they are not generally used. Carbon monoxide, in cylinders or as motor-car exhaust gas, affords the most humane weapon where it can be used without danger to human life and "cyanogas" is almost as good, but sulphur candles are cruel because a sub-lethal dose of SO_2 appears to cause very slow suffocation through inflammation of the lungs. For houses the method of "blocking"‡ is recommended. This consists in ground-baiting a room until the rats are in the habit of frequenting it, when the exits are closed and the rats destroyed with terriers or clubs. Little attention has been paid to this matter by any of the humanitarian societies.

We now turn to the subject of slaughtering. The usual methods of slaughtering sheep and pigs in England involve much suffering, and the pole-axe, used for cattle, involves suffering whenever there is a mishit. In Scotland the use of the humane-killer, a special kind

* Particulars will be given by the A.S.T.C., 36, Gordon Square, W.C.1.

† Mark Hovell, "Rats and How to Destroy Them," p. 147 (John Bale, Sons and Danielsson, 1924).

‡ Mark Hovell, *loc. cit.*, p. 173.

of pistol, was recently made compulsory for the majority of sheep and cattle, but not for pigs, and about 350 local authorities in England and Wales have made by-laws enforcing its adoption. Elsewhere the old-fashioned methods still prevail. The methods of handling bacon pigs are specially objectionable ; the animals are mechanically hoisted by one leg and suspended on a conveyer, where they are stuck and bled. Other reforms which are called for in connection with slaughtering are the concentration of the work into central abattoirs, permitting of adequate inspection ; the licensing of slaughtermen, to ensure that these shall be skilled and responsible persons ; and the introduction of pig-traps,* stunning-pens, and other machinery for obviating the rough handling which at present is frequently necessary. The number of cattle, sheep, and pigs slaughtered annually in Great Britain is of the order of fourteen millions. The use of the humane-killer is being strenuously pressed forward by the R.S.P.C.A., the Scottish S.P.C.A., the Council of Justice, and other societies. The Model Abattoir Society concerns itself especially with the design of abattoirs and their accessories, and the Animal Defence Society has constructed at Letchworth a model abattoir which deserves to be visited.

I turn to a further form of cruelty—the practice of operating on pigs and other animals without preliminary anæsthetisation, particularly as regards the castration of pigs and lambs and the spaying of sows. It does not seem to be generally realised that the Animals (Anæsthetics) Act of 1919 permits what is quite literally " vivisection," the cutting alive of certain animals without anæsthetics, not for experiment but in the ordinary course of agricultural work. The spaying of sows, for instance—a serious operation which consists in opening of the body and removal of the ovaries—is ordinarily performed without anæsthesia. I have no statistics as to the number of animals affected, except that the pig population of Great Britain is about two and a half millions. The Ministry of Agriculture has power to extend the provisions of the Act to animals and operations not at present within its ambit, so that progress need not be obstructed by the tedious procedure of a private bill. Further, operations are performed and treatment is given by persons who are not qualified veterinary surgeons. These may be " cow-doctors " and other unqualified practitioners who work for fees, or they may be well-meaning but eccentric animal-lovers.

A further important form of commercial cruelty lies in the discharge of oil waste on the high seas by oil-driven ships. Large masses of oil waste drift about the ocean for long periods, and sea-birds which have become covered with this substance lose the power of flying, swimming, diving, and obtaining food. They die a prolonged and miserable death. No statistics are available as to the number of birds affected, but it must be very great, for some 500,000 barrels of oil are discharged into the sea every year, there to accumulate until driven ashore. The remedy lies in the installation of separators on oil-driven ships, and British and American shipowners have led the way in adopting this reform. There are still, however, some British and many foreign shipowners who will not incur the cost of installing separators, although these are said to pay for themselves

* Particulars of a pig-trap due to Mr. H. S. Barrett can be obtained from the Scottish S.P.C.A.

in two years by means of the economies they effect. The subject is receiving special attention from the Royal Society for the Protection of Birds. That society would be particularly glad to receive any well-authenticated information as regards the effect of oil waste on fish.

It would be easy to go on adding to this list of disagreeable facts with regard to our treatment of animals, but I have already given enough instances to indicate the existence of commercial cruelty so severe, and on such a large scale, that any one who could visualise it in its entirety would probably lose his reason at the thought of so much horror. Can nothing be done to put an end to it?

Certainly efforts are being made by the great societies which have done so much in the past to diminish other forms of cruelty. But I want to urge that scientific men have a very definite contribution to make to this great cause. There are more ways than one in which its progress depends in a vital manner on the ascertainment and accessibility of the relevant facts, and it is in the verification of facts that the scientific mind is specially trained.

There is one class of facts which very obviously needs to be brought to the mind of the layman. He needs to be very well instructed in the proper care of the domestic animals he keeps. Many agencies are co-operating with the great societies to this end, and mention ought to be made of the happily-named Tail-Waggers Club, which will soon be conveying to a million dog-owners sound information as to the proper care of their pets. The Young Farmers' Club, organised by the Ministry of Agriculture, is doing excellent work also with regard to farm stock.

I should like, however, to put forward the suggestion that at present we are not making enough use of those splendid friends of animals, the veterinary surgeons, for the purpose of educating the young. Would it not be practicable to arrange for systematic instruction to be given by them in schools, or at all events to teachers, with regard to the management of stock and pets?

Having thrown out that suggestion with regard to domestic animals, I should like to go back to the battle which is being fought against commercial cruelty, and to emphasise the importance of a sound intelligence service to the forces which are engaged in it.

In the first place, opinion differs acutely among animal-lovers as to the strategy and tactics to be adopted. Hitherto attempts have been made to settle the points at issue by means of mutual recrimination, but what is really needed is a rigorous examination of the facts. Let me give a non-controversial instance coming from France. There are certain cruel sports—such as shooting with a carbine at a tethered and much wounded farmyard duck or rabbit, or slashing blindfold with a *coupe-chou* at the neck of a live goose suspended by the leg, or bull-fighting of the Spanish type, *avec mise à mort*—which have the support of only a small public; while there are two others, cock-fighting in the north and the *courses landaises* in the south, so universal that no newspaper would dare to attack them. Hitherto the *coqueleurs* and the *razeteurs* have effectually prevented any attempt to strengthen the Loi Grammont, which imposes a fine of tenpence for cruelty perpetrated in public. The problem is, therefore, whether or not to conciliate the *coqueleurs* and *razeteurs* by exempting their sports from the proposed reforms. Such a question cannot be settled by

recrimination. It depends upon facts. How many animals are affected by each kind of sport? What degree of suffering is inflicted by each, and how long does it last? What are the relative strengths of the zoophile societies and the *sportsmen?* It is only by taking account of these facts that an effective policy can be laid down.

Again, in the western counties of England the strongest opponents of the horrible steel-toothed trap are the hunting community. This is inconsistent on their part, for hunting is a cruel sport: but actually it is the state of affairs. A great zoophile society was recently invited to attack stag-hunting, and was informed at the same time that if it did so its hunting members generally would withdraw their support. It had to choose, therefore, between attacking stag-hunting on one hand or retaining its most effective anti-trapping members on the other. Such a decision as this ought clearly to depend on matters of fact, and not on mutual recrimination. The numbers of animals affected are about 300 stags per annum on one hand, and some thirty or forty million rabbits on the other. The intensity of suffering is that due to exhaustion, fear, and ultimate destruction by dogs in one case: it is that due to crushing of limbs, fear, thirst, and exhaustion in the other. Its duration is a matter of an hour or two in hunting, and from a few hours to a few days in the case of trapping. I submit that in the determination of policy facts, such as these, ought to weigh more than any private and personal feelings which we may experience.

Further, when the policy to be adopted has been determined, the presentation of ascertained facts is a most important element in the steps which must be taken to give effect to that policy.

There are three ways in which human beings can react to strong emotions—namely, by immobility, by panic, or by rational resource. Take, for instance, the emotion of fear. In a theatre fire, some of the victims may be so paralysed by fright that they can do nothing to save themselves, while others are seized with wild panic which defeats its own object. The only useful reaction is of the third type—namely, that in which a man coolly collects his thoughts, and searches about to find practical means for circumventing the danger. Similarly, there are three kinds of reaction to the picture of cruelty. The commonest, unfortunately, is that of immobility. The subject is unpleasant, and there is a strong temptation to turn away from it, excusing oneself by the pleas that nothing can be done or that the matter can be left to the R.S.P.C.A. Secondly, there is the panic reaction. Every announcement of a real or alleged act of cruelty brings to the perpetrator a number of abusive letters, often hysterical and sometimes obscene. Frantic rhetoric, wild allegations, useless attacks by one zoophilist on another or on the veterinary profession or the Tail-Waggers Club—all these are forms of the panic reaction to cruelty; and by alienating public sympathy they hinder the animal cause as much as a panic hinders the work of a fire brigade.

On the other hand, certain rational methods have been employed by the R.S.P.C.A., the S.S.P.C.A., and other responsible societies for the purpose of obtaining practical results in the diminution of animal suffering, and the most important of these will be found to depend directly on the ascertainment and publication of verifiable facts.

The first method consists in legislation, with subsequent enforcement of the law. Some of my hearers may have been astonished to learn that the law still permits such great cruelties as the use of the steel-toothed trap, poisons which cause three days of acute pain, obsolescent methods of slaughtering, and serious operations without anæsthetics on certain animals ; and they may be inclined to ask why the R.S.P.C.A. and kindred societies have not secured the prohibition of such barbarities. The reason lies in the extreme difficulty which is experienced in legislation by means of private bills. Not only does the procedure on private bills offer every facility for obstruction by the vested interests concerned, but great difficulty may be experienced in refuting effectually the propaganda carried on by those interests —propaganda, be it remembered, whose standard of veracity is that of the advertisement hoarding rather than of the scientific periodical. It is precisely in these circumstances that the presentation of a mass of carefully verified facts is of vital importance. We may take as an example the subject of humane slaughter. An act enforcing humane slaughter in Scotland was introduced by Brigadier-General Charteris and passed in 1928, and a two-thirds majority of the House of Commons had been promised for the corresponding English bill introduced by Lieut.-Colonel Russell Moore, though unfortunately the obstructive tactics of certain members deprived the bill of a second reading. This degree of success must be attributed mainly to the very careful and systematic amassing of indisputable facts of experience by the societies which sponsored the bill—namely, the Scottish and the Royal S.P.C.A. But of all the evidence which was put before the House of Commons, the most vitally important comprised the results of two scientific investigations carried out by scientific men—namely, the two veterinary meat inspectors and the medical officer of health of the City of London Corporation,* and two physiologists of Edinburgh. The Meat Traders' Association had given currency to some astonishing allegations with regard to humane slaughter, such as that it renders the meat unsatisfactory for consumption, that it causes blood-splash in pigs, that the humane-killer is less reliable than the pole-axe, and so on. The observations which were made on a large number of animals by the City Corporation officers afforded a complete and final refutation of these allegations, while Professor Dryerre and Dr. Cameron established the painfulness of the usual method of killing sheep. These findings put the cause of humane slaughter on an entirely new footng. One could scarcely ask for a more striking instance of the value to the zoophile cause of the scientific ascertainment of verifiable facts.

Since legislation by private bills is such a slow and tedious business, and since it is tactically unsound to legislate in advance of public opinion, one of the most important problems before the zoophile movement is the education of the public. Here again the principles of the A.S.L.I.B. are applicable, for most British citizens are far more favourably influenced by the citation of verifiable facts than by emotional rhetoric.

The British public is humane in its sentiments, but it regards the expression of strong emotion with dislike and is intensely suspicious

* Corporation of London, " Report on Humane Slaughtering of Animals " (Guildhall, 1925).

of anything that looks like exaggeration. Moreover, the press, which affords by far the most effective channel for publicity, will not publish facts whose authenticity is not adequately guaranteed. Can it be said that all of the fifty or more animal protection societies have been as careful to disseminate verifiable facts as they have been eager to arouse emotion? I think not; but I think it can fairly be said that the R.S.P.C.A. and its more responsible congeners have never been convicted of issuing misleading statements, and it is on their reputation for strict veracity that their influence must necessarily depend.

Before concluding I would suggest that there is one subject, the fur trade, about which it is desirable to collect as soon as possible the fullest and most carefully documented information. At the present moment that trade has not been seriously affected by the humanitarian movement, and it could well afford to ignore our efforts; yet already there have been attempts to mislead the public as to the amount of cruelty involved. We must expect that at a more advanced stage of the battle the enormous wealth of the fur companies will be made available for propaganda at least as reckless as that which has been directed against humane slaughter. If ever such a prodigiously wealthy interest comes to be fighting for its life against the conscience of civilised mankind, we may expect a very desperate campaign, the issue of which will depend on the care and thoroughness with which the relevant facts have been ascertained and made available. Disinterested information, from as many parts of the world as possible, is needed as to the length of sample trap lines, frequency of visit, number of traps per trapper, method of trapping, and percentages of animals found dead, or wrung-off, eaten by wolves, or otherwise wasted.

In conclusion, I would appeal to scientific men to put their peculiar gifts at the disposal of the excellent cause which we have been discussing. Many have already done so. It would be difficult to exaggerate the value of the support given to that cause by such men as Charles Darwin, Alfred Russell Wallace, Benjamin Ward Richardson, Sir J. Arthur Thomson, Sir Peter Chalmers Mitchell, Professor Frederick Hobday and the veterinary profession generally, and many others whose names it is unnecessary to catalogue. If it is true that the aims of the A.S.L.I.B. are closely relevant to the ultimate deliverance of the animal creation from its age-long travail, it follows that there is an urgent call for the assistance of men who are specially trained to give effect to those aims.

DISCUSSION.

The discussion following Captain Hume's paper was contributed to by the following: Mr. J. J. Robinson (British Science Guild), Mr. J. A. S. Barrett (Scottish Society for Prevention of Cruelty to Animals), Sir James Douglas (Model Abattoir Society), Captain E. T. MacMichael (Performing and Captive Animals' Defence League), Major F. J. Taylor (Royal College of Veterinary Surgeons), Lady Mary Murray, Mrs. H. G. Massingham (Royal Society for the Prevention of Cruelty to Animals), Dr. A. L. Sheather (Royal College of Veterinary Surgeons), and Mr. G. H. Livesey (Royal College of Veterinary Surgeons).

Captain Hume's paper, together with a full report of the discussion, has been reprinted, and can be obtained on application to the University of London Animal Welfare Society, c/o University of London Union, 68, Torrington Square, W.C.1.

[025.347]

The Inadequacy of the Alphabetical Subject Index.

By
PROFESSOR A. F. C. POLLARD, A.R.C.S., A.M.I.E.E., F.Inst.P.,
AND
Dr. S. C. BRADFORD, F.L.A.

CONTENTS.

		PAGE
1.	Preamble	39
2.	Incompleteness of references to literature in published indexes	40
3.	The difficulties inherent in the alphabetical system	42
4.	Alphabetical-subject indexing	43
5.	Examples of subject indexing	44
6.	Annual and decennial indexes	46
7.	Cross references	46
8.	Classification and the alphabetical relative index	47
9.	The practical application of a classification	47
10.	The comparison of unclassified and classified systems	48
	Appendix	50

1. Research in general, like industry, is becoming slowly rationalised and the basis of joint research is being broadened, necessitating quick and easy reference to published literature. Even the individual specialist must co-ordinate his activities with those working on related subjects.

The various branches of science and technology are becoming more and more dependent upon one another. Development in one field has immediate repercussion in others, which formerly pursued a distinct path. Witness, for example, the intimate relations between developments in acoustics, electricity, and optics in connection with recent technical applications such as broadcasting, wireless, talking pictures, etc. Such interdependence of the sciences gives rise to increased difficulties in indexing the written documents, the contents of many of which may be of considerable interest, if not of importance from the developmental point of view, to more than one field of science.

It is clearly the task of the indexer to ensure that such documents may be available to an interested investigator in any one of these fields no matter what his specific enquiry may be.

The difficulties of this task are increased by the fact that researches in countries formerly regarded as comparatively unproductive are assuming an ever-increasing relative value, thus producing a growing volume of literature to be indexed. Altogether, the absolute bulk of scientific and technical literature has grown both in magnitude and cost to dimensions which prohibit representation adequate for the specialist, save by large libraries.

The necessity of attempting to index this mass of literature, so that the information relative to a given subject may be available at need, has produced a multitude of bibliographical undertakings. Unfortunately, however, there is little co-ordination between these enterprises, either in regard to the literature or subjects indexed, and in many cases the methods of indexing employed are faulty. Moreover, on account of the variety of systems adopted, it is impossible to amalgamate these multifarious bibliographies into a single index and consequently the labour of consultation is enormously increased. The specialist must collect all the various bibliographies that may contain references to information relating to his subject, study the particular method of arrangement of each, and then search each of the parts of which each bibliography is composed. It is now beginning to be recognised that the general adoption of a standard system of classification is necessary to bring order out of this chaos. As one of the methods most favoured by bibliographers is the alphabetical, we have attempted to point out its defects in the present paper.

2. In the first place, no existing index deals with the whole literature of any one subject and generally it will be found that no single index covers even a large percentage of the total references required by a specialist. We give an example, taken at random, on Aerial Surveying in 1927, using the term surveying in a rather broad sense.

The table facing this page indicates the reference on this subject extracted from three well-known indexes.

It will be observed that out of twenty-four references in the " Engineering Index " only three have been repeated in the " Bibliography of Aeronautics ' and only one in the " Zeitschrift für Vermessungswesen."

None of those appearing in the two latter is shared by either of them, neither do any of these references appear in " Engineering Index." This mutual exclusiveness, so to speak, is not by any means confined to the subject chosen. It is a feature of all bibliographies and is due in part to the fact that owing to the deficiencies of libraries, no bibliographer can have a complete collection of the literature of his subject for the purpose of indexing. It will be observed, also, from the example given that the system of alphabetical headings differs in each publication.

As another example of the necessity of consulting more than one bibliographical work in an attempt to obtain exhaustive references to the literature of a subject, we quote the following study by Mr. Lancaster-Jones, Deputy Librarian of the Science Library, who is a

Index Heading.	*References in the Engineering Index.*	*References in the UNITED STATES: National Advisory Committee for Aeronautics, Bibliography of Aeronautics.*	*References in the Zeitschrift für Vermessungswesen.*
AERIAL PHOTOGRAPHY	1. Diehl, Highway Mag. 18, 3. 2. Antilli, Riv. Aeron. *3*, 3. 3. Ramsey, U.S. Nav. Inst. Proc. *53*, 7. 4. Inst. Aer. Eng. Jl. *1*, 4. 5. Aviation. *22*, 9. 6. Ramsey, Aviation. 23, 24. 7. Rumpf. Amer. City. *36*, 5. 8. Hotine, Roy. Eng. Jl. *41*, 1. 9. Queensland Gov. Mining Jl. *28*, 327.	Do.	
MAPPING. Aerial photog. applied to.	10. Eliel, Mil. Eng. *19*, 107. 11. Boyden, U.S. Nav. Inst. Proc. *53*, 7. 12. Von Blon, Sci. Am. May, 1927. 13. Baldini, Riv. Aeron. *3*, 4. 14. McCaw, Surv. Inst. Jl. *5*, 10-11. 15. Pitts, Am. City. *37*, 3, 354-6. 16. Elec. News. *36*, 20, 1927.	Do.	
SURVEYING. Aerial.	17. Aeroplane. *32*, 20. 18. Jl. Inst. Aer. Eng. *1*, 7. 19. Rohleder, V. Deutsche Bauzeit. *61*, 117–21, 130–2. 20. Simon, Deutsche Bauzeit. *61*, 13.	Do. (Quotes only three articles out of four.)	Do.
Aerotriangulation. Photogrammetry.	21. Jl. Inst. Aer. Eng., *1*, 6. 22. Krahner, Jl. Inst. Aer. Eng. *1*, 9.		
Topographical exploration.	23. Baltensperger, Bul. tech. de la Suisse Romande. *53*, 1927. 24. Bartley, Can. Eng. *52*, 14.		
ALASKA.		25. Pop. mechanic. *47*, 220–1. [Aerial mapping of Alaskan mountain ranges.]	
MAPPING. PHOTOGRAPHY.		26. American City. *37*, 195–6. 27. Pop. Mech. *47*, 543. 28. Aviation. *22*, 18. 29. Sci. Amer. *136*. April. 30. Literary Digest. *92*, 62–7. 31. L'Aeronautique. 9me anée. 97. 32. Erickson. Aviation. *23*, 14. 33. Fairchild. Aeroplane. *33*, 1. 34. Hotine, Prof. Papers of Air Survey Cttee. 3. 35. Tymms and Porri. [Bk.] H.M.S.O.	
SURVEYING.		36. Aeroplane. *32*, 7, 176–8. 37. Aeroplane. *33*, 18. 38. Flight. *19*, 20. 39. Fuller. Pop. Avn. *1*, 1 } Also under Photography. 40. „ „ „ *1*, 3 } 41. Hall. Jl. R. Aer. Soc. *31*, 201.	
KARTOGRAPHIE u. ZEICHENHILFSMITTEL.			42. Abendroth. Verness. Rundschau. *4*, 57–65. 43. Basse. Allg. Vermess. Nachr. *39*, 577–85, 593–603. 44. Breitfuss. [Bk.]
TACHYMETRIE, TOPOGRAPHIE und PHOTOGRAMMETRIE.			45. Dietrich, Bildmess. u. Luftbild wes. *2*, 141–60. 46. Basse. Der Kulturtechniker. *30*, 116–24. 47. Dahl, Mitt. Reichsamt Landesaufnahme. *3*, 37–40. 48. Ewald, Zs. Flugtechn., u Motorluftschiff. *18*, 187–95. 49. Gasser. [Bk.] 50. Gendre. Jl. des Geom. Exp. 1927. 264–8. 51. Hoecken. Zs. Instr. 47, 189–96. 52. Jaarverslag v.d. Topog. Dienst in Ned. Ind. 1927. 97–103. 53. Krahmer. Flugtechn. u. Motorluftsch. *18*, 203–5. 54. Krahmer Luftfahrt. *31*, 70–2. 55. Koerner, Bildness u. Luftbildwes. *2*, 31–4. 56. Labussière. Sci. et Ind. photograph, 1927. 51–3. 57. Nistri. [Bk.] 58. Richter. Der Kulturtechniker. *30*, 37–9. 59. Riel, Tijdschr. voor Kadaste in Landmeetkunde. *43*, 99–110. [Also under Kartographie.] 60. Schulze, Bildness u. Luftbildwes. *2*, 176–85. 61. Werkmeister Bildness u. Luftbildwes. *2*, 49–50.

[*To face page* 40.

geophysicist and who has recently taken a census of lists of references relating to Geophysical Prospecting (Applied Geophysics) in articles published in 1928. Some interesting facts emerge.

The total number of independent items obtained from the whole mass of abstract and index lists consulted was 309. A six months lag was allowed in all cases, so that copies of the periodical lists were consulted up to the middle of 1929.

A special annual bibliography, compiled by " Economic Geology," under the sectional editorship of Dr. Heiland, himself a consulting geophysicist and a notable compiler of references, contained 224 of the total 309. This can be considered a very exceptional percentage, only possible in special cases, where the scope of the subject is very restricted and the indexer is an enthusiast.

The two leading periodical indexes in this field, those issued by (*a*) " Mining and Metallurgy " and (*b*) The " Zeitschrift für Geophysik," had totals of 108 and 103 references respectively—*i.e.*, about one-third of the whole number.

A recently-commenced Abstract Series, issued specially for this subject by the United States Bureau of Mines, had only 64 references for 1928, but as this publication only commenced about the beginning of 1929, the figure is hardly a criterion of its completeness. It will certainly contain a much larger percentage of 1929 references.

" Physikalische Berichte " had 65 references out of the 309. That may be considered a good proportion for an abstract index covering a wide scope. Other indexes which reckon to include this subject, among others of more general scope, had numbers varying from 17 to 33. Altogether, thirteen such indexes were consulted by Mr. Lancaster-Jones and six additional references were obtained from other sources.

The following table, which has been prepared under the direction of Sir Frederic Nathan, shows that the references printed in two of the largest bibliographical reference works at present published, cannot be regarded as exhaustive :

Number of Abstracts which appeared in January, 1930, in British Chemical Abstracts and American Chemical Abstracts.

	British Chem. Abstr.	*American Chem. Abstr.*
Argentine	1	21
Australia	2	9
Austria	7	4
Belgium	4	6
Brazil	5	—
Canada	9	48
Chile	1	—
Czecho-Slovakia	18	33
Denmark	1	1
Finland	2	1
France	106	176
Germany	422	752
Great Britain	220	296
Holland	32	42
India	2	22

	British Chem. Abstr.	*American Chem. Abstr.*
Italy	32	81
Japan	27	105
Malay	1	—
New Zealand	—	2
Poland	12	14
Roumania	2	4
Russia	50	77
Spain	29	33
Sweden	3	4
Switzerland	9	23
U.S.A.	256	778
	1263	2532

We are aware that a number of indexes adopt the dangerous practice of sifting what are considered to be important from unimportant references. This fact may explain some of the differences of the figures in the comparative list of British and American Chemical Abstracts, but this criticism cannot be applied to the study made by Mr. Lancaster Jones, who is himself a specialist and considered every one of the 309 references worthy of consultation.

These three examples, which could be multiplied indefinitely, confirm the first fact we desire to place on record—*i.e.*, the failure of any one periodical bibliographical index to list even a large percentage of the total literature on a specific subject.

3. The difficulties inherent in the alphabetical system of subject-indexing are due to the fact that the notions to be indexed may be described in each language by a variety of different combinations of different words, any one of which may be selected for an index entry, and the alphabetical order of no series of selected combinations has any direct connection with the relationship to one another of the notions expressed.

Moreover, as the notions to be indexed are not simple, the difficulties are further increased. Each concept may be regarded either as one of a larger class or group of notions or as forming a class or group of smaller concepts. Actually, ideas may be classified in a variety of ways—for instance, ships may be subdivided into steel, iron, wooden, etc., ships, or into steam, sailing, motor, etc., ships. But, in one way or another, it is possible to devise a classification of knowledge, in which the minor classes may be as specific as we please, and every conceivable concept shall have one, and only one, place, each class being denoted by a symbol having a definite order of succession in the notation of the classification. The Universal Decimal Classification, described by us in various papers, is such a classification. With the aid of such a classification, every notion can be indexed by means of its appropriate symbol, which is always the same and independent of the words in any language that might happen to be selected for its verbal description. Consequently such a classification can be used for the international co-ordination of the work of any number of bibliographers, whose efforts can be brought together

into a single index, from which all the references to the indexed information relative to a particular subject may be selected with a minimum of effort.

Logically, the adoption of the principle of alphabetical arrangement amounts to the rejection of that of classification. And, in so doing, it excludes also the possibility of international co-operation. Moreover, in practice it is found impossible to apply the purely alphabetical arrangement to any extensive bibliography. The number of possible combinations of words that might be chosen to express a given idea is so considerable that it becomes necessary to use a series of selected subject-headings. In using a classified index the inquirer realises that information relating to his subject may also be found in the larger groups of which his subject forms a part, or in the subdivisions of its class. But, as related subjects are scattered throughout an alphabetical index, in such an index cross-references must be added in order to direct the searcher to the headings under which relevant information may be found. Consequently most alphabetical indexes are based on an unseen classification, comprising a series of selected subject headings combined with a system of cross-references. This concealed classification is before the indexer in making his index, but is withheld from the patient enquirer, who must painfully piece it together for himself like the parts of a jig-saw puzzle. Moreover, when the magnitude of a comprehensive classification of knowledge is realised, it is inconceivable that an adequate concealed classification, weighted with the overwhelming mass of cross-references that would be necessary to connect all related subjects, could be used as the basis of an alphabetical index. In fact, the idea of the modern alphabetical index, which attempts to combine alphabetical arrangement with an unseen classification is an absurdity. We now proceed to consider its practical application.

4. On account of the large number of combinations of words that may be selected as the basis of an alphabetical index, the system of Alphabetical Subject Indexing differs in every publication; and consequently the searcher must learn the particular system of each index he consults. In some well-known bibliographies the system is so involved as to be positively misleading, in the sense that the searcher may be led to suppose that he has been exhaustively directed to the references sought.

In practice the concealed classification, with its network of cross-references, must be incomplete, and is usually supplemented by words from the title of the publication to be indexed. In the sequel, owing to the mass of synonyms available to authors in titling their contributions, articles of essentially similar contents are hopelessly scattered under a series of headings, which even an elaborate, time-wasting system of cross-references can hardly save from complete futility. On the other hand, only too often the code-word selected by the indexer is a very general one, so that articles of widely-different characteristics come together in the index.

Classification by title is nearly always disastrous, and the chance of suitable selection of the index heading is remote. We substantiate these remarks by a few examples taken at random from good-class indexes.

5. If we take, for example, the general subject of Prospecting, Geophysical, we find:

(1) In the "Engineering Index," 1927—

10	References under	PROSPECTING, ELECTRICAL.
2	,, ,, ,,	GEOELECTRICAL.
1	,, ,, ,,	EÖTVÖS TORSION BALANCE.
5	,, ,, ,,	GEOPHYSICAL.
1	,, ,, ,,	METHODS.
1	,, ,, ,,	NEW METHODS.
2	,, ,, ,,	OIL.
1	,, ,, ,,	SEISMOGRAPHIC.

There are, moreover, no cross-references to such necessary terms as APPLIED GEOPHYSICS or PROSPECTING, GRAVITATIONAL.

(2) In the "Institute of Mining and Metallurgy, Bulletin" there are references under PETROLEUM, PROSPECTING, GEOPHYSICAL.
and under MINING, PROSPECTING, GEOPHYSICAL.

(3) In "Glückauf" there are references under MINERALOGIE UND GEOLOGIE.

(4) In the "Geologisches Zentralblatt" there are references under ALLGEMEINE GEOLOGIE, PHYSIKALISCHE UNTERSUCHUNGSMETHODE.

We are assured by Mr. Lancaster-Jones that there are some 200 references to be found for 1927 on Geophysical Prospecting, of which a fraction is given in the four indexes quoted.

Let us now take an example from the Subject Index to Vol. XXX, 1927, of "Science Abstracts."

Suppose that we desire to find what has been published with reference to Mercury Arc Rectifiers. We naturally turn to RECTIFIERS and find:

MERCURY-ARC Power Rectifiers, cooling	Abstract No.	519
,, ,, Rectifiers	,, ,,	321

Then to:

POWER STATIONS (Operation and Design)

and find, only by examining *every* entry under this head:

AUTOMATIC Mercury Arc Rectifier Substations	Abstract No.	335
,, Rectifier Substation, Palais Du Midi, at Brussels	,, ,,	336
,, Supervisory Controlled Substation of the New York Rapid Transit Corporation	,, ,,	234
CAHOKIA, Power Station, St. Louis, Experiences at	,, ,,	134
DESIGN and Construction of Power Plants	,, ,,	145
ELECTRICAL Development, Present Day	,, ,,	520
110-KV SUBSTATION, Construction of	,, ,,	138
POWER, Generation, Annual Report of Committee on Power Generation	,, ,,	341
SUBSTATIONS, Standardisation of	,, ,,	338

and then referring to MISCELLANEOUS (Generators, Motors, Transformers, and Rectifiers) we find no references.

We then turn to TELEGRAPHY AND TELEPHONY (Wireless) and find :

RECTIFIER, High-Tension for Low Power Transmitter . . . . . Abstract No. 596
RECTIFIERS, Experiments on . . . . „ „ 198
WIRELESS Developments. Chairman's Address „ „ 573

Feeling a little unhappy we next turn to TESTS (Prime Movers and Kindred Plants) and find nothing, but under TRANSFORMERS, Rotary CONVERTERS AND BOOSTERS, we find :

DIRECT AND ALTERNATING CURRENT, Transformation of, by Static Apparatus . . Abstract No. 320

This discovery makes us feel we must start our search all over again with the main notion of " Transformer " instead of " Rectifier.' But with the laborious result that we must at least examine each of the papers quoted and, with the unsatisfactory feeling that other references to Mercury Arc Rectifiers lie hidden in the Alphabetical jumble, our patience comes to an end. We have, however, attempted to study only one volume of the Index to the " B " Abstracts, and since Mercury Arc Rectifiers may be included also in the " A " Abstracts we must repeat our labours for Volume XXX with the same unsatisfying result. " Science Abstracts " have proposed a new scheme for alphabetical indexing, which is just as unsatisfactory.

Let it be noted, further, that, to get all the information we seek we must examine not one volume of " Science Abstracts " in this way, but more than thirty volumes, as well as all the existing bibliographical works on Electricity we can lay our hands upon. We realise the confusion which exists and the necessity of introducing order into this chaos.

Turning now to " British Chemical Abstracts," 1928, we find the references :

" *Transmission of ultra-violet radiation by various fabrics* " indexed under FABRICS, transmission of ultra-violet radiation by, but not under RADIATION (or Rays) ultra-violet.

" *Excitation by the arc spectrum of nitrogen* " indexed under ACTIVE Nitrogen, but not under SPECTRA or ARC, although there are several references under SPECTRA, excitation of.

" *Tanning Barks in Madagascar* " indexed under MIMOSA, tannins from bark of, and under various species of plant investigated, though it is not indexed under TANNINS.

" *Drying oils : VII. Adsorption of liquid by oil gels* " indexed under OILS, but not under ADSORPTION, GELS, or FILMS.

" *Comparative antirachitic value of various marine animal oils* " indexed under the various animal oils and OILS, Marine, but not under RICKETS, though there are several references here.

" *Metabolism of stationary and growing tissues* " indexed under METABOLISM and TISSUES, but not under GROWTH, though there are several references here.

" *Origin of the Spectrum of the Solar Corona* " indexed under CORONA, but not under SUN, SPECTRUM, or SOLAR SPECTRUM.

These examples serve to show that, in spite of the great care which has been bestowed upon the preparation of the indexes to British

Chemical Abstracts, the method of Alphabetical Subject-indexing is treacherous and well nigh impossible to carry out in a logical manner.

6. We will now compare the Annual with the Decennial Alphabetical Subject Index by a few examples again taken at random from Vol. IX, 1915, "American Chemical Abstracts," Annual Index:

Under the alphabetical heading GEOLOGY the references are listed in order of page in the volume. Thus:

GEOLOGY of Hanagita—Bremner region, Alaska (p. 1021), is separated from GEOLOGY and Ore Deposits of Copper Mountain and Kansan Peninsula, Alaska (p. 1732), and this latter reference is also indexed under ORE DEPOSITS.

In the Decennial Index, 1907–1916, under GEOLOGY, the former of the above two references is indexed under the alphabetical subheading HANAGITA, but the latter reference is not indexed at all under Geology.

This latter reference is indexed under ORE DEPOSITS, ALASKAN.

On p. 2312 of Vol. IX of the Abstracts "U.S. Patent on Dynamite" is to be found in § 24 Explosions and Explosives.

In the Annual Index this reference is indexed under DYNAMITE-PATENTS, but not under EXPLOSIVES, or NITRO-GLYCERINE.

In the Decennial Index, the reference is to be found under DYNAMITE, MANUFACTURE OF, but not under EXPLOSIVES, or NITRO-GLYCERINE.

Again, on p. 2863 of the Abstracts we find "The Composition of Brachiopod Shells."

In the Annual Index, it occurs under BRACHIOPODS AND SHELLS, but not under ANALYSIS, COMPOSITION; PHOSPHORUS; or PHOSPHATE DEPOSITS.

Whilst, in the Decennial Index, we find the reference under BRACHIOPODS only and not under PHOSPHATE DEPOSITS (although there is a reference here to marine forms of Phosphate deposits), ANALYSIS, MOLLUSC SHELLS (which has several references), or SHELLS.

7. We have already referred to the necessity of a system of cross-references in indexes of the alphabetical-subject type.

As an example we take the Subject Index to Periodicals, 1927, published by the Library Association. The faults in this index, which even the most cursory examination reveals, are those that are inseparable from the system adopted, and which no reasonable amount of care on the part of the collaborators could have avoided—*i.e.*, the juxtaposition of incongruous subjects and the separation of related ones. The entry under the heading "Cells," with articles on living cells, of a paper on the geometrical properties of space—stackability of tetrakaidecahedra—is reminiscent of the bibliographer's classification of "Lead, Kindly Light" with "Lead pipes." If one would seek for studies on the properties of living cells, one finds two papers under "Cells," with cross-references to "Embryology," "Golgi Apparatus," "Kariokinesis," "Plant Cells" and "Tumours," and under each of these headings there are several further cross-references and so on.

Should one desire to investigate the acoustics of buildings, under ACOUSTICS there are no entries, ACOUSTICS leads to ARCHITECTURAL ACOUSTICS, where eight papers are filed, to MUSIC: ACOUSTICS with

no papers, and to SOUND with no papers. From SOUND one reaches MUSIC : ACOUSTICS again, thence coming back to ARCHITECTURAL ACOUSTICS, but with a reference also to ECHO, where two more papers are found, though no reference to the Albert Hall echo occurs here. This is to be found under ALBERT HALL. But a reference to that heading is given under ARCHITECTURAL ACOUSTICS. This heading also leads to BUILDINGS, SOUND PROOFING with three papers, and CHURCH ARCHITECTURE with two more.

Looking for articles on Geophysical prospecting, one finds none under GEOPHYSICS, but a cross-reference to PROSPECTING with one article ; this leads to ELECTRICAL PROSPECTING with one more, and thence to TORSION BALANCE with another article. There is no reference to a paper on the " Applications of Sound-prospecting to Geophysics " which is listed under SOUND : PROPAGATION. If the subject were more comprehensive, the maze of cross-references would be still more bewildering, leading in the end to the collection of references to the papers of only a single year. These observations remind one of the Kaiser system of indexing, in which the effort is made to provide sufficient cross-references as required. This system is a cross-reference system set out on moveable cards, with cards bearing the titles of papers placed behind the appropriate " term " cards. Every term is correlated with every other possible term, so that, after a few references have been filed, it is possible to have more cross-reference and term cards than title cards, and when the index reaches any magnitude, a new term may require to be entered upon some hundreds of cards.

8. From what has been said it is clear that the Alphabetical Subject Index used by itself is not a solution of the problem of indexing documents. It should be remembered that documents are not dissertations upon *single words*, but are concerned with *notions*, which frequently are extremely complex.

Notions may be expressed by simple words, but more generally can only be expressed by lengthy phraseology. When this is realised, the utter futility of the Alphabetical Subject Index without a corresponding scheme of classification becomes apparent. A good classification must always be accompanied by an alphabetical index of terms, so that any term employed may be immediately transformed into its appropriate classification notion. Such an alphabetical index of the relative type used in conjunction with a universal classification scheme, as the Universal Decimal Classification, and covering all the principal languages, is an aid of first-class importance to the individual searcher. At the same time, its completeness warns the classifier that he must classify according to the actual characteristics of the article rather than by its title.

He will learn, for example, to distrust the use of such ambiguous words as " Survey " in a title. He will appreciate that an article on " Locomotion " need not necessarily be concerned with mechanical engineering.

In an Appendix we give the " Rules for Preparing the Alphabetical Index to the International Classification," which have been devised for use in the Science Library and which perhaps may be of utility to those who desire to prepare alphabetical indexes of the relative type.

9. By the use of a classification code, the cost and labour of elaborating the usual decennial and even the annual alphabetical index is avoided.

A key manual is once and for all prepared containing the classification scheme with its code and an alphabetical relative index of principal terms only. This key may be completed with well-selected examples of how the code is applied to the actual references and with an explanation of the function of the alphabetical index.

Such a key manual* has been prepared by one of us for the indexing of papers appearing in the Optical Society's Transactions or any other papers of optical interest.

A published " part " of the bibliography would have its references and abstracts individually coded and arranged in the order of the classification. Virtually the classification-code functions in the same way as the usual pagination by numbers, but with this difference, that the code symbol may appear over and over again in the various parts of the publication.

The searcher having selected the correct code symbol (which in the Decimal Classification is a decimal number) by aid of the alphabetical index, should find the required references in a bound volume of " parts " with scarcely more labour than by the use of the usual method of pagination, but with the distinct advantage that the same code symbols are to be sought in all the volumes of the bibliography. Thus no decennial, or even annual, index is necessary, since such an elaborate and costly undertaking would be replaced by the publication of a supplement to the alphabetical index containing only the additional terms which may have arisen in the interim.

In the process of indexing by means of a standard classification, provided with a symbolical notation and relative index, each paper or abstract is given as many code symbols or classification numbers as are needed to define its scope, and the bibliographical notices or abstracts are arranged in the order of the code symbols. To avoid printing each bibliographical notice or abstract under each of its code symbols, when there are two or more, each notice or abstract should also be given a serial number, which can be printed instead of the notice or abstract under the subsequent classification symbols.

When it is possible to cut up the references and paste them to cards, the advantages of this system are too obvious to need discussion.

Important and curious effects emerge from the use of such a system of indexing references to literature—the mind rapidly learns to envisage the intricacies of a given subject in an orderly manner and is led to differentiate and contemplate detailed subdivisions which otherwise would never have been realised. This latter effect is more particularly striking when an attempt is made to classify a document the contents of which are not fully understood. Such mental exercise can only have beneficial effects upon the mind itself and consequently upon the progress of human activities in general.

* The Decimal Bibliographical Classification of the Institut International de Bibliographie. Partly translated for the formation and use of a Universal Bibliographical Repertory, concerning Optics, Light and Cognate Subjects, 1926. Published by the Optical Society.

10. In conclusion, we have seen that in the Alphabetical Subject Index—

1 References to *related subjects* must be scattered throughout the whole repertory.
1.1 There is no method of co-ordinating related references within the subject except by a complicated labyrinth of cross-references which is difficult or impossible to elaborate with completeness, and is time-wasting for the searcher.
2 There is the danger of dissociating references to *essentially the same subject* by the use of synonyms.
2.1 This danger can be reduced by employing a concealed classification together with a second elaborate system of cross-references—*i.e.*, from synonyms. But as the unseen classification is inflexible and necessarily incomplete, the indexer is forced to employ terms, usually taken from the authors' titles, which do not belong to the considered classification and are unconnected with either series of cross-references.
3 Essentially unrelated references are likely to be brought together under terms that may have widely-differing meanings —*e.g.*, such words as "Survey" may mean almost anything.
4 There is risk of assuming that an expression used metaphorically is intended literally; and
5 The use of an alphabetical system excludes the possibility of collaboration with other bibliographers, especially in different countries.
5.1 This implies the perpetuation of the present chaos of independent bibliographical effort, with a maximum of inefficiency and of labour to the searcher.

On the other hand, none of these objections is inherent in a classified index, since—

1 Related references are brought together by the classification,
1.1 and consequently cross-references within the subject are not required.
2 The classification enforces the contemplation of notions, the same subject must be indexed always in the same place.
2.1 No series of cross-references from synonyms is required, since the classification is not concerned with titles,
3 apparent similarity of terms, or
4 metaphorical expressions. Thus the use of a standard classification ensures a maximum of efficiency, and
5 serves to unify the work of all those using the same system, so that their references may be brought together into a single index, which may be consulted with a minimum of effort.

In conclusion, we would like to state once more that the examples we have used to support our statements were taken quite at random from a few well-known bibliographical indexes. If examples had been specially selected, an even stronger case might have been made out against the Alphabetical Subject Index, but we felt that such a procedure would weaken rather than strengthen our contentions.

APPENDIX.

RULES FOR PREPARING THE ALPHABETICAL INDEX TO THE INTERNATIONAL CLASSIFICATION.

1. The index entries should be written on cards or slips 5in. by 3in., only one complete entry on a card—that is, no card should have more than one number.

2. The entries should be " relative "—*i.e.*, the catch-word should be qualified by a subsidiary term, set in on a second line, indicating the special relation of the idea expressed by the catch-word—*e.g.* :

Lighting
  Electrotechnics 621.32

3. If a term of an entry comprises more than one word, as Magneto-optical phenomena, capitals should be used only for the first word of the term.

4. The catch-word selected for an entry should be a noun ; unless an adjective or adverb forms part of a compound expression, such as Dark rooms. Thus Incandescent lamps should be indexed :

Lamps
  Incandescent.

5. The catch-words should be collective terms—*i.e.*, when there are a number of objects in the class indicated, the catch-word should be in the plural, thus :

Boilers
Vaccines.

6. The terms of an entry should be the terms of the classification, except in the case of synonyms, when, generally, the relative terms will still be terms of the classification.

7. In the actual classification, only one of many possible synonyms is normally employed ; the Index, however, should enumerate all customary synonymous terms, but the synonyms should not be subdivided. For example, the terms " voltage, pressure, potential, tension " are synonyms in electrical phraseology, and the searcher should find each one indexed. In this case " voltage " is the only term specifically restricted to electrical subjects, so this would be selected as the best term under which to develop any necessary subdivisions.

8. Prepositions should be avoided if possible—*e.g.* :

Elasticity		Elasticity
Gels	*not*	of Gels
Measurement		Measurement of

9. The Classification numbers are entered at the end of the last line of the entry against the term to which they correspond. Thus :

Lighting
  Electrotechnics 621.32

10. Index entries should be subdivided as little as possible. Each entry should be as specific as can be. The main subdivisions of an entry should not be included, as :

Lighting
  Electrotechnics 621.32
    Arc Lamps 621.325
    Incandescent Lamps . . 621.326
      Carbon filament . . 621.326.1
      Gas-filled . . . 621.326.72
      Metal filament . . 621.326.2
        Etc.

Or Analysis
  Chemistry
    Inorganic
      Qualitative . . . 543.7

But the most specific terms should be indexed separately, as :

Lamps
arc 621.325
Lamps
Gas-filled 621.326.72
Lamps
Nernst 621.327.2
Analysis
Inorganic
Qualitative 543.7

A specific entry may need a relative term. For instance, Incandescent lamps may be either electric or gas or oil, so would be indexed :

Lamps
Incandescent
Electrotechnics . . . 621.326
Etc.

11. The extent to which the Index is to be developed depends upon its function, which is primarily to enable the average, educated searcher to locate the references he requires. It can be assumed that the classification used is available for consultation with the Index. On the one hand, the Index must not be restricted solely to the function of a " guide " to the classification manual itself. On the other hand, it is certain that many of the complex notions employed in the classification cannot be expressed by a simple Index entry. For example, the classification allows for all references of the type : Use of A in B (*e.g.*, Use of Aluminium in Conductors), to be grouped together, both under A and B, by means of the colon symbol. It would be assumed that a searcher looking for references of this type would be familiar with the system, so that if the Index directs him firstly to A, and secondly to B, he will find the group of cards required in its proper position.

It cannot be assumed that the classification automatically proceeds from main to subsidiary classes, although this ruling principle is observed in the majority of cases. It will, therefore, not be possible to restrict the Index only to the classes more important numerically. The classification must be studied, group by group, and all the essentially specific classes involved must be indexed—*e.g.*, " devices for protecting cables " 621.315.687 is grouped with " junctions of cables," but each requires a separate index under :

Cables
Electricity
Protection 621.315.687.6
and
Cables
Electricity
Junctions 621.315.687.1

It will be noted that " Cables " is more specific than " Protection " or " Junctions."

12. As a rule entries should consist of one or two terms and no entry should comprise more than three terms. In a few cases more terms will be needed, and then they should be grouped in three lines, as :

Water
Analysis, Chemistry
Impurities, Total . . . 543.311

The actual grouping will depend on the number of items likely to occur under a given term.

13. The Common Analytical Subdivisions—of Place, Time, etc.—can be separately indexed and incorporated in any special Index. The Special Analytical Subdivisions, applicable to some special group or groups in the Classification, require particular emphasis in the Index concerned. The corresponding Index entry should indicate the special character, and extent of applicability, of each entry of this type. Thus the qualifying characteristic " high-voltage " is a Common Analytical Subdivision of the whole of 621.3, and should be indexed :

Voltage
high, *Analyt. Subd. of* 621.3 . . . . . .027.3
Reagents
Analysis, Chemical, *Analyt. Subd. of* 544/545 . . . -1

In some cases, the same term may have several numbers, corresponding to different groups. Thus "electrodes" occur in:

Electrodes

Lamps, Electrotechnics, *Analyt. Subd. of* 621.32 . .	.032.2
Furnaces, Electro-thermal, *Analyt. Subd. of* 621.365 . .	.036.6
Electrochemical technology, *Analyt. Subd. of* 621.35 . .	.035.2

DISCUSSION.

Mr. H. T. Tizard asked if the Universal Decimal Classification was suitable for making the indexes of books as well as for indexing literature generally.

Mr. L. D. Goldsmith suggested that the difficulties in tracing information about "Mercury Arc Rectifiers" in the alphabetical subject index would be equally met with in the case of the Universal Decimal Classification.

Mr. Theodore Besterman said that not even Professor Pollard's and Dr. Bradford's brilliant exposition of their views had convinced him that the decimal index was, in fact, as universal as it claimed to be. It was no doubt true that most alphabetical subject indexes were defective, but no evidence had been put forward to show that similar defects would not appear in the decimal or any other system of classification. These defects were not inherent in the alphabetical method as such, but were due to the incompetence of the average indexer. It would be equally easy to point not only to defects in actual bibliographies constructed on the decimal system, but even in the very structure of the system. Thus, to select a few examples at random, it seemed scarcely efficient to have to look under 91: Geography and Travels, for Archæology; under 57: Biology, for Anthropology and Ethnology; and under 13: Mind and Body, for Psychical Research. So illogical, indeed, was the ground plan of the classification in its non-scientific sections (though even these were far from perfect) that it could not be used by the light of intelligence alone: it was necessary to master the system as a whole. And there could be no guarantee that even then all librarians and bibliographers would apply it uniformly; indeed, examples could be quoted to show that already they had not done so. The user of a library or bibliography arranged on the decimal system was dependent on the alphabetical index attached to the classification proper. And it certainly seemed somewhat absurd that a system intended to supersede the alphabetical subject index should be itself utterly dependent on such an index. At the same time, the considerable extent to which the Dewey system or its Brussels revision had been adopted was undoubtedly a powerful argument for its still further adoption, and it seemed most probable that this system would gradually supersede the others now in use in the fields, at any rate, of science and of technology.

Dr. W. Bonser said it was claimed for the Universal Decimal Classification that any single subject would be represented by a single entry, but that in an alphabetical subject index it is scattered under various alphabetical terms. This was, however, the case also with the Universal Decimal Classification, and instanced "crystallography," which appeared under physics, crystallography, and geology.

Mr. H. Rottenburg said opponents of the decimal system often forget that it is first of all an international language in which words are replaced by numbers. Besides this, of course, it shows what main divisions the subject is a subdivision of, a thing the alphabetical index completely fails to do. 632.6 is on the face of it a sub-sub-sub-division of that subject which is designated by 632, which again is a sub-sub-division of that which is designated by 63 and so on.

The statements that the necessity for an alphabetical guide to the decimal classification proves it a failure is equivalent to saying that because you have to resort to a dictionary when you want the French for, say, a "hat," therefore French as a language is a failure.

Mr. L. C. Wharton pointed out that the use of classification for placing books on the shelves of a library was different from that indicated in the paper. In fact, in the Soviet Union and in other countries the habit had grown up of giving the classification of all series of books for the former purpose behind the title page and also, in an increasing number, the classification of the subjects contained in it as such, however numerous.

Mr. F. Donker Duyvis made the following contribution to the discussion: Mr. Besterman had observed that an alphabetical index was necessary in order to use the Universal Decimal Classification. In Holland this classification is extensively used for filing municipal archives and industrial correspondence, where a far more minute classification is required than in the case of books or

journal articles. No alphabetical index is used; in fact, its use is forbidden, so as to compel individuals to work and think systematically. In certain cases the use of an alphabetical index is not only superfluous, but practically impossible. For example, in patent offices where a thorough preliminary search is made (*e.g.*, in Germany, Holland, Austria, the U.S.A.) a very minute and exact classification is necessary because the patents granted give a certain guarantee of novelty. All these offices use numbers or number letters, not an alphabetical system because the detailed rubrics cannot be indicated by a simple catchword; in many cases a large number of catchwords would be required. On the other hand, to an enquirer unfamiliar with the Universal Decimal Classification the alphabetical index is a convenience. In any systematic classification there is a possibility of a number of references to the same subject, as mentioned by Dr. Bonser, but the number is very small as compared with the number in the case of an alphabetical subject index. Where the decimal classification is of special value is where a standard classification is required for international exchange purposes, when it is necessary to be independent of language.

Professor Pollard said, in reply to Mr. Tizard, that the Universal Decimal Classification could be applied as readily to one form of document as another. He thought Mr. Goldsmith's contention was not quite right. There could be no possible chance of confusing "Mercury Arc Rectifiers" with other closely related notions. He thought the authors had made this quite clear in their paper, but he would repeat that in the systematic tables of the Universal Decimal Classification the equivalent notion of every decimal number was clearly defined not only by the appropriate terms and synonyms, but also in many cases by explanatory text.

In reply to Mr. Besterman, Professor Pollard continued, the alphabetical subject index was an individual product, peculiar to *a* mind or a small group of minds, which attempted to lead the searcher direct to specific detail in the repertory. The relative alphabetical index to the Universal Decimal Classification, if required at all, was merely a "dictionary" list of words leading the searcher to a group of relative notions in the systematic tables, which was a very different process.

Sir F. Nathan wound up the discussion with the following remarks: I think there is general agreement as to the necessity of the general adoption of a standardised system of classification if the immense quantity of information in every intellectual field is to be made readily available to those whose interest or duty it is to keep abreast of it. The authors' study of the alphabetical subject index leaves me with the impression that it is far from satisfactory from the above point of view, although it may adequately meet individual cases such as those that have been indicated to us. It seems to me that every alphabetical subject index can have no real international and probably very little national use. On the other hand, the Universal Decimal Classification is based on the use of numbers, which are the same all the world over, so that all literature, whatever its source, indexed by it is available to all for building up bibliographies. I look forward with confidence to the time when the adoption of the Universal Decimal Classification for indexing abstracts bulletins prepared on identical lines by every nation, but each one dealing only with its own literature, will afford a ready means for institutions, libraries, and individuals to keep themselves abreast of the published information within their own spheres of interest.

Mr. W. Barbour submitted the following written contribution:

May I contribute a few remarks on this paper. I have had about eighteen years' experience in indexing by the Kaiser system, and I collaborated with Mr. Kaiser in applying his system for the first time to scientific and technical information. The authors say that certain matters remind them of the Kaiser system, and they describe in two sentences their present conception of the Kaiser system. This conception is a mistaken one.

(1) The cards of the central index do not bear the titles of papers. They bear statements of information contained in the document regarding the specific "notion" conveyed by the term ("concrete") under which the card is filed. This "notion" may be dealt with in a casual way in the document itself, and neither the title nor a summary of the document may convey the fact that this information is given. The cards in the dictionary catalogue for books bear the titles of the books under the filing term, as they do in most libraries, but the dictionary catalogue is a separate thing altogether from the central index and supplements the information given in the latter.

(2) The authors state that in the Kaiser system every term is correlated with every other possible term. This is not really the case. The correlation is quite systematic and is limited. It results in the production of a small number of

" genealogical trees." At the head of each is one of the main headings denoting the subjects dealt with by the index—*e.g.*, plant, material, product, labour, money, etc.—and at the foot the most minutely specific terms. The main headings and their chief sub-divisions are carefully thought out and tabulated for reference before the index is begun. These trees grow rapidly at first, but more slowly later, and the gatherer of information is led, when required, from branch to branch by means of synonyms. This is really the crowning achievement of the Kaiser system.

The statement that it is possible to have more cross-reference and guide and guide cards than title cards after a few references have been filed is not the case in practice. Every card bearing a distinct filing term (and the relative abstract of information) has a guide card in front of it. As the index grows the number of cards behind each guide increases, though at any given time there will be a few guides in the index without cards behind them. With lapse of time the proportion of guide cards diminishes.

The statement that when the index reaches any magnitude a new term may require to be entered upon some hundreds of cross-reference cards completely mystifies me.

The authors refer to the " dangerous " practice of selection in the work of indexing. In special library work, failure to discard useless information would be " dangerous " to those responsible for the index work.

Professor Pollard and Dr. Bradford communicated the following remarks on Mr. Barbour's communication :

All we intended to convey by our brief reference to the Kaiser system of indexing was that it is an alphabetical subject indexing method with an elaborate arrangement of cross-references.

Whether the terms are called " concretes," " synonyms," " higher collectives," " lower specifics," or " process " terms, they form in Mr. Barbour's own words "genealogical trees" and "the gatherer of information is led, when required, from branch to branch by synonyms." This is precisely what we meant by " every term is correlated with every other *possible* term."

Surely the use of titles of papers should not prohibit the application of the system. If the central index cannot contain titles of papers, etc., in place of " statements of information " gathered from the papers, but reference to titles must be made in the dictionary catalogue, surely this is a defect of the system. There are two separate indexes, one of which supplements the other. If, therefore, the documents to be indexed were of many kinds, such as series of iconographic material, we should have to have a series of indexes supplementing one another.

In the proof of our paper, seen by Mr. Barbour, the words " cross reference " should be deleted from our statement that " a new term may require to be entered upon some hundreds of cross reference cards."

We mean by this that it is possible for a " process " term to arise after the classification scheme has been thought out, and this process term, in an index of any magnitude, may require to be provided for some hundreds of concretes, and therefore may require to be entered upon some hundreds of cards.

We quite agree with Mr. Barbour that information which is useless to an institution devoted to well-defined and circumscribed activities must be discarded in any index elaborated for the unique use of that institution. But our paper and the statements in it refer to published bibliography for universal use, and we repeat that it is dangerous, dangerous in the sense of possible irreparable loss, for a bibliographer to assume an autocratic attitude in the compilation of an index to any branch of knowledge.

No man can foresee whether an apparently trivial contribution may or may not give rise to a train of thought culminating in an important development.

The histories of science and industry are not without examples. In an index admittedly designed to aid the worker in general, the assumption of such autocratic action might occasionally defeat the very object of the undertaking.

Finally, the Kaiser system is a one language system, and therefore cannot be used internationally.

The World Power Conference

Mr. D. A. Bremner had been unable to prepare a paper for circulation to the delegates and, as no arrangements had been made for verbatim reporting, only a summary of his address can be printed. He gave an account of the history of the World Power Conference from its inception and of the first conference, which was held at the Wembley Exhibition in 1924. The growth of the World Power Conference had been remarkable. At the conference held in Berlin in 1930, 3,900 members were present, representing forty-six countries. Mr. Bremner described the remarkable arrangements made to handle a conference on this scale: the army of interpreters, reporters, and so forth. In assessing the value of the conference, he asserted that this consisted, chiefly, in the opportunity offered for meetings and interchange of views between individuals, the actual material presented in papers being of a kind better to be assimilated in the study. His views as to the value of the voluminous published Proceedings of the World Power Conference and his suggestions as to the possible application of some kind of quality test to them were of great interest to ASLIB members.

Opening the discussion, the CHAIRMAN (MR. C. A. SPENCER) presented a resumé of the Report of the Sub-Committee on Bibliographies of the World Power Conference which had been prepared by Dr. Lander, Director of Fuel Research in the Department of Scientific and Industrial Research. The main provisions of the scheme for the dissemination of information relating to power and fuel prepared by the sub-committee and now adopted by the International Executive Committee are as follows: (1) Each country should abstract its own literature. (2) The abstract should be prepared in one of the three official languages of the conference (English, French, or German). (3) The abstracts should be classified in accordance with the Universal Decimal Classification of the Institut International de Bibliographie of Brussels. (4) The abbreviated titles of journals, etc., given in the abstracts should be those of the "World List of Scientific Periodicals."

MR. C. H. GRAY, Secretary of the International Executive Council of the World Power Conference, said that he was glad that his Council had just joined ASLIB, as he was sure they would gain a great deal from association with its work, and perhaps would be able to contribute a little.

Sir Frederic Nathan had spoken of the work of the Bibliographies Sub-Committee of the British National Committee: work which had resulted in recommendations being put before the International Executive Council in June, and accepted by that body. He could inform those present that there was no doubt but that in Great Britain, Germany, the United States, and Japan, at any rate, effect would be given to the decision of the Council almost immediately, and that other countries would soon follow suit.

The International Executive Council, which met annually, was composed of delegates from the member National Committees of the World Power Conference. National Committees were, in their turn, composed of delegates from all the most important bodies concerned with power. To take a very typical National Committee: the British National Committee was composed of representatives of a number of Government Departments; Ministry of Transport, Board of Trade, Home Office, Department of Scientific and Industrial Research, etc.; of the principal institutions, civil, electrical and mechanical engineering, etc., and of such manufacturers' associations as the B.E.A.M.A., the National Federation of Iron and Steel Manufacturers, and, in addition, of a number of other bodies.

At the meeting of the International Executive Council held three years ago it had been decided to prepare forms for the collection of statistics on a co-operative

basis relating to the power resources of the world. Thereafter it was hoped that the present practice of many countries trying to issue returns relating to other countries, and of giving figures which were strictly non-comparable with those issued elsewhere, because not on a uniform basis, would be avoided.

The procedure adopted was as follows. The preparation of draft forms had been entrusted to a number of National Committees: Bituminous Coal—Great Britain; Hard Coal—Germany; Oil, and also Natural Gas—United States; Peat—Poland; Wood—Sweden; Wind—Denmark; Tide and also Sun Power—France. The draft prepared had been circulated to all the National Committees of the World Power Conference, and by them submitted to the appropriate authorities and experts. It was the duty of the National Committee, after taking due account of all criticisms, to submit semi-definite forms for final adoption by the International Executive Council.

After four years' work it was hoped that final adoption would be possible next year. At its meeting this year the Council had authorised the Central Office to begin to issue a Statistical Year-book, based upon the returns made when these forms had been circulated and completed, as soon as possible.

Mr. Gray added that it was expected that the electrical statistics already collected by the Union International des Producteurs et Distributeurs Electrique would be included. It was the policy of the conference to assist the Union, through its National Committees, in the completion of its forms.

He thought this scheme might be regarded as an example of that rational presentation of information for which ASLIB stood.

Dr. G. Freitag said: I understand that it is part of the programme of ASLIB to assist in the organisation of conferences. In addition, your presence here this evening to listen to Mr. Bremner's address shows that you have some special interest in the work of the World Power Conference. Accordingly, I hope, you will be interested to hear a few words from me regarding the experiences of the German National Committee, which had the honour of planning this, the second Plenary Meeting.

We were faced with two main difficulties. In the first place there were nearly 380 papers submitted through our National Committees and, although the closing date for their acceptance was supposed to be November 1st, 1929, many papers were still outstanding by April, 1930, or two months before the conference began. Then the expense of editing and printing so many papers is necessarily very high. The International Executive Council is considering a different procedure for future conferences. Only several reports covering technical progress since the last meeting in each branch, contained in the programme, would be published. The individual papers would be printed in the technical press of the world, during the preceding period, and distributed in the form of reprints. This would be arranged through our national committees. In this manner we trusted that the first difficulty would be largely solved. The second difficulty seems inherent in the organisation of conferences, and is particularly marked in connection with large international gatherings.

It is quite impossible to induce many prospective members to register until immediately before the conference opens. I can offer no suggestions as to how this problem may be overcome.

May I conclude by thanking you for allowing me to address you. I am sure that both the Central Office and the German National Committee of the World Power Conference would always be most glad to place the experience which they have gained in the running of conferences at the disposal of members of ASLIB.

There was a long discussion, in which the following took part: Sir Frederic Nathan, Mr. H. T. Tizard, Mr. Norman Parley, Mr. B. M. Headicar, Mr. Theodore Besterman, Dr. S. C. Bradford, Mr. E. A. Martin, Mr. F. A. Hoare, Dr. R. S. Hutton, and Dr. A. P. Thurston.

Surveys and Planning: their relation to Organised Information.

TOWN AND REGIONAL PLANNING.

NOTES BY G. L. PEPLER, F.S.I.
Past President of the Town Planning Institute.

It is refreshing to address an audience which already appreciates that there is ever any need for organised information. In this country, rule of thumb rules the roost; the planner is often suspected of being an interfering busybody, and the man who prefers to base action on ascertained data is thought to be infirm of purpose.

Nevertheless, despite this temperamental indifference to forethought, planning has, of recent years, made remarkable headway—more than a third of the country is covered by regional planning committees and some 550 authorities are preparing town planning schemes embracing about 5,500,000 acres.

It is now up to the planner to convince his clients that his schemes are so good and so founded on reality that it is worth their while to pay something in order to safeguard the future and to preserve their heritage.

It has been said that the chief object of Town Planning is to secure that all land shall be put to its most productive use in the interest of the community as a whole and with due regard to health, amenity and convenience.

The surface of our land has suffered so sadly and its resources have been so wasted through lack of planning that one might feel safe in saying that any plan is better than none. On the other hand, it is surely worse to aim in the wrong direction rather than to drift there, and, therefore, anyone presuming to plan must make as sure of his ground as possible, and this he can only do by acquiring information in an organised manner.

He must first make a thorough study of the place to be planned, of the possibilities and potentialities; next propound a policy of conservation and development, and then prepare a scheme and plan to carry out the policy accepted by his clients, to the fullest possible extent.

The principal items of town or regional planning schemes include: communications; zoning, *i.e.*, provisions to secure that so far as can be contrived, the right kind of building shall go in the right place, properly relating function to site; open spaces; and amenity provisions such as preservation of trees, control of advertisements, etc.

Appended to this paper is a list of the Regional Planning Reports which have been published, and perhaps it may be of value to give a general idea of the information they contain. They vary in form: in some cases they begin with a separate survey and conclude with

proposals based on the data it contains ; in others, data and proposals are given side by side.

It will be a great help to planners if the Association of Special Libraries and Information Bureaux are able to say of which items they have or could have organised information available. Also, if local libraries will follow up the publication of a regional planning report or town plan by drawing the attention of local inhabitants to the information contained in the libraries, relating to the history and evolution of the place.

REGIONAL SURVEYS.

Geology.

These usually begin with geology as that affects the structure of the ground, often explains why some things are where they are, indicates suitability of sites for various purposes, minerals to be worked (this has a bearing on surface workings and the distribution of population and industry), and sometimes reveals resources which are lying idle because facilities for development are not available.

In the case of a coal-mining area, it is usual to call for a special report from a mining engineer, and valuable reports have been secured, for example, in the Doncaster, Midland, Sheffield, and South-west Lancashire Regions.

General information is obtained from such sources as the Geological Survey Maps, and from specialists such as Professor Reynolds and Dr. Bolton in the Bristol and Bath Region (who, I believe, showed the old geological survey to be inaccurate). Stone, sand, gravel, brick-earth, chalk, etc., all have a commercial value and their working has to be provided for in a general scheme which balances all considerations.

The Geological Chapter in the Bristol and Bath Report reads like an Edgar Wallace romance, as one waits breathlessly to learn what the next convulsion of nature will bring forth.

Physical Characteristics.

The items covered under this heading include a description of the surface of the land, its contours, hills, valleys, rivers, marshes, land liable to flood, etc., and historic data as to the influence of these features on lines of communication, siting of settlements, etc., is of value.

Statistics and graphs as to rainfall, sunshine and prevailing winds, all have their bearing on the appropriate siting of certain human activities. Dry and sunny spots for housing ; smoky factories to leeward of houses ; appropriate sites for aerodromes.

A study of soils and vegetation is sometimes included in this Section. In the North-East Kent Regional Report the authors express their indebtedness to Mr. Geoffrey E. Hutchings and to the handbook, of which he is joint author, " Stockbury : a Regional Study in North-East Kent."

History.

We must know something of what happened in the past and the causes, if we are to plan wisely for the future. Also, we must not waste or obscure our heritage.

The historical survey usually includes a note and plans showing and describing archæological remains, indicating what each past age has done and the apparent reasons for the form and siting of the works of which remnants remain.

Frequently each town or village is described separately, and buildings and other points of interest are noted.

In East Kent, the County Archæological Society were kind enough, at the suggestion of Sir Reginald Tower, to form a special sub-committee, which, under the chairmanship of Sir Martin Conway, collected information for the Regional Report which Professor Abercrombie and Mr. Archibald were preparing.

Communications.

A careful study is made of all existing means of communication, of their capacity, function and interrelation. Time zone maps are sometimes prepared indicating the time distance by train, tram or 'bus, from the chief centres of congregation. Statistics as to density of traffic, points of congestion, danger or excessive gradient are graphed, and a diagram illustrates the main structure of the existing system of communications and indicates the gaps and weak spots.

Surface Utilisation.

By map and description, the main purposes for which the land in the Region is used is indicated and a study is included of the various types—*e.g.*, industrial, residential, shopping, public buildings, etc.

The West Middlesex Report contained information as to the number of industries, their character, where they were situated, their relation to means of communication, public services, etc., the number of people employed and where they lived, where their raw product came from and how their output was distributed. In order to obtain some of this information, a questionaire was circulated to the principal industrial concerns, but the response was not as complete as it might have been.

The Chesterfield Regional Report contained a valuable analysis of existing industries, the trend of their movement and of their future possibilities particularly in relation to efficient siting.

The Bristol and Bath Regional Report introduced a novel chapter headed " The Activities of the Region," in which the region was first considered as a local entity, next its external relations were discussed, then the main groups of developed areas were described, and lastly the principal industries such as coal mining, quarrying, engineering, were dealt with in detail.

In most reports an attempt is made to discover the needs of industry, the probabilities of expansion, the possibilities of attracting new industries and what they will require in respect to site, transport, public services, etc. ; how many people may be given employment and where and how they should be housed.

In some regions it is indicated that there is ample scope for further development but that it should not be tacked on to old growth but rather guided into satellite or self-contained form.

Land Values.

Any programme of conservation and development must take into

account land values, and such values sometimes appear to bear little relation to physical facts. It is desirable, therefore, to indicate general comparative values on a map. This question has been carefully surveyed by Dr. Unwin in the first Report of the Greater London Regional Planning Committee, which report also contains examples of how some of the consequent problems are being dealt with in Germany.

Local Government and Public Services.

Details are given as to the local authorities at present operating and their division of function, and suggestions are made as to matters in which co-operation is desirable—*e.g.*, Town Planning, Water Supply, Sewerage Disposal.

The areas of service of the various public services are indicated and their sources of supply. Water catchment areas are marked out, and steps necessary to retain purity of supply are indicated. This information not infrequently indicates that efficiency and economy in public services would be greatly facilitated by grouping development in appropriate places and keeping the bulk of the remaining land in its rural state.

Population.

Population is studied in relation to its present density, growth, health, means of livelihood, etc., and in respect to the steps necessary to improve present conditions and cope with the future.

If the planners' ideal of grouped development, as opposed to a fortuitous scattering of buildings, is to be achieved, it is essential that sufficient land should be earmarked for development. A study of the growth of population in the locality and estimates as to the future are therefore necessary and usually reveal—*e.g.*, in the Brighton, Hove and District Interim Regional Report—the comparatively small proportion of land that is ever likely to be required for the accommodation of buildings.

The last census contained additional information and it is now possible to prepare not only occupational charts but also diagrams indicating the daily ebb and flow between home and place of work.

Density of population in the various parts of a district can usually only be ascertained by a special survey.

Landscape Survey.

This can best be described by quoting the introduction to the subject in the Bristol and Bath Regional Report: "In the present imperfect stage of landscape studies it is no easy matter to make a survey of the landscape in so varied and complex a region as this. There is the initial handicap of an imperfect means of notation or classification of landscape effects. Dr. Vaughan Cornish, Past President of the Geographical Association, has announced that he hopes to put forward a system by which æsthetic geography can be ascertained and mapped as scientifically as political, social, vegetable, orographical and geological data. But pending this more precise instrument of study, a rough attempt has been made to divide up the region into areas of different types of landscape and to analyse their components. By this means the predominant characteristics can be

ascertained, the effect of future developments upon them gauged, and existing discordances pointed out. Later in the report this landscape survey is correlated to the zoning plan, under which is shown the most suitable uses to which the land can be put with a view of developing economic resources and conserving natural amenities."

In this Report the countryside was divided into the following five main divisions : Low-lying lands, normal agricultural land, land of remarkable landscape value, wilder areas, features of particular beauty or landscape importance. And this part of the Report concludes with a catalogue of existing and possible disfigurements.

CIVIC SURVEY.

The items referred to above are those, other than and precedent to proposals, to be found in the various regional surveys which have been carried out preparatory to the preparation of regional plans and reports. The regional plans, when made, are implemented by Town Planning Schemes prepared by the constituent councils of the Joint Town Planning Committee, either jointly or severally ; with this difference, that the Regional Plans are not limited by statute whereas the Town Plans are. For example, some regional reports contain valuable suggestions in regard to good methods of estate development and the design of and materials used in buildings, whereas the statutory schemes only contain general regulations governing such matters and lay down the routes of roads, building lines, areas to be reserved as open spaces, density and character of building, etc.

Up to the present it has not been the practice for individual towns to prepare and publish complete civic surveys prior to the preparation of Town Planning Schemes. Surface utilisation maps and various studies are frequently made but are not usually put together or published in the form of a complete Civic Survey. A notable exception is the City of Sheffield, where, under the direction of Professor Abercrombie, a complete Civic Survey was made, which covered most of the items already referred to in describing regional surveys, and, in addition, for example, a closer study of vital statistics in relation to housing density and conditions, and a note of the structural state of groups of buildings as giving an indication of their relative life and of the successive periods when reconstruction schemes could be carried out most economically and with least disturbance.

Several valuable surveys, from which the planner can obtain useful information, have been carried out voluntarily—*e.g.*, that for Bishop's Stortford recently published in " Observation," by the Leplay House Press.

Map Notation.

It would be a great convenience if a uniform international notation could be devised and adopted. Attempts have been made by the International Federation for Housing and Town Planning, and a few main items have been agreed, but individual fancy baulks at standardisation and a lot still remains to be done in this field.

I have only dealt very briefly and scantily with a large and absorbing subject, but perhaps sufficiently to indicate the vast amount of information which the planner requires to enable him to understand his problem and deal with it effectively. He wants to learn as much as he can, not only of the history of the place with which he is dealing, and of what exists on, over, or under the ground, but also its character, the means by which its inhabitants gain their livelihood, their home conditions, health, culture, amusements, recreations, etc., and the deficiences from which they suffer due to environment or confusion or lack of facilities.

The members of the Association of Special Libraries and Information Bureaux will render a great public service if they can assist towards the organisation of this information. I am not sure how far you are concerned with the dissemination of information but am certain that, for example, the library of every secondary school ought to possess a copy of any regional or local survey and planning report relating to its district (the Kent County Council arranged this in the case of the East Kent Regional Survey). Also, that public libraries should also possess themselves of such reports and could render great public service by giving them prominence, together with all books relating to the history, topography, life, and industry of the place.

I am here as a learner—not a teacher—hoping to be told how the regional or civic surveyor can be helped in his search for information.

REGIONAL PLANNING.

List of Published Reports.

Doncaster Regional Planning Scheme. Messrs. Hodder and Stoughton, Ltd., Warwick Court, London, E.C. 10s. net.

Deeside Regional Planning Scheme. Messrs. Hodder and Stoughton, Ltd. 7s. 6d. net.

West Middlesex Joint Town Planning Committee.
Preliminary Report upon the Regional Survey. Mr. E. S. W. Hart, Guildhall, Westminster, London, S.W.1. 5s. net.
Final Report and Plans. 10s. 6d.

Thames Valley Joint Town Planning Committee.
Preliminary Report upon the Regional Survey. Mr. W. T. Goodale, Council House, Mortlake, Surrey. 3s. 6d. net.
Final Report and Plans. 8s. 6d.

Rotherham Region Report. Mr. C. L. des Forges, Town Hall, Rotherham. 7s. 6d.

East Kent Regional Survey. Mr. F. A. Cloke, 51, Strand Street, Sandwich, Kent. 10s.

South Tees-side Regional Report. Mr. Preston Kitchen, Municipal Buildings, Middlesbrough.

Wirral Joint Town Planning Committee. Mr. E. W. Tame, Town Hall, Birkenhead.

Leeds and Bradford Region. Mr. T. Thornton, 11, Park Square, Leeds.

Lancaster and Morecambe Region. Messrs. Hodder and Stoughton, Ltd., Warwick Court, London, E.C. 10s.

Manchester and District Joint Advisory Committee.
Report and Plan. Mr. S. Hill, Town Hall, Manchester.

West Kent Regions Report covering South-West Kent and North-West Kent Regions. Messrs. Vacher and Sons, Ltd., 10, Great Smith Street, Westminster, S.W.1. 10s. 6d., or 11s. 6d. in stiff board; postage extra.

Chesterfield Joint Town Planning Committee. Messrs. Bales and Wilde, Gluman Gate, Chesterfield. 11s. post free.

North-East Surrey and West Kent Joint Town Planning Committee. Mr. J. M. Newnham, LL.D., Town Hall, Croydon. 3s.

Hertfordshire Regional Planning Report. Messrs. Vacher and Sons, Ltd., 10, Great Smith Street, Westminster, S.W.1. 7s. 6d.

Mid-Surrey Joint Town Planning Committee. Mr. Alfred Smith, Town Hall, Reigate. 10s. 6d.

Brighton, Hove, and District Joint Town Planning Committee.
Preliminary Report. Mr. J. H. Rothwell, C.B.E., Town Hall, Brighton. 10s.

South Tyneside Region Report. Mr. W. Swinburne, Town Hall, Gateshead-on-Tyne. 10s.; postage 9d.

North Middlesex Joint Town Planning Committee. Mr. E. S. W. Hart, M.B.E., Guildhall, Westminster, S.W.1. 10s. 6d.

North-West Surrey Joint Town Planning Committee. Mr. Francis Mountain, Council Offices, Woking. 10s. 6d.

South Bucks and Thames-side Regional Planning Report. Mr. C. W. Gladwell, Denmark House, Windsor Road, Slough, Bucks. 10s. 6d.; post free 10s. 9d.

Arundel, Littlehampton, East Preston, and District Joint Town Planning Committee Report ("West Sussex Coast and Downs"). Mr. J. W. Calvert, Town Offices, Littlehampton. 5s.

Leeds and Bradford Region Joint Town Planning Committee.
Final Report. Mr. Thos. Thornton, 11, Park Square, Leeds. 11s. 3d. net.

Mid-Cheshire Joint Town Planning Advisory Committee. Mr. H. Grant Bailey, Westminster Buildings, Newgate Street, Chester. 10s. 6d.

East Kent Region Joint Town Planning Committee.
Final Report. Mr. P. W. Austen, St. George's Street, Canterbury, Kent. 7s. 6d. net.

Greater London Regional Planning Committee.
First Report. Messrs. Knapp, Drewett and Sons, Ltd., 30, Victoria Street, Westminster, S.W.1. 5s. net; by post 5s. 6d. net.

North-East Lancashire Joint Town Planning Committee. Sir Lewis Beard, Town Hall, Blackburn. 12s. 6d.

North-East Kent Regional Planning Scheme. Mr. F. C. Boucher, Town Clerk's Office, Gillingham, Kent. 7s. 6d.

Bristol and Bath Regional Planning Scheme. Messrs. Hodder and Stoughton, Ltd., 20, Warwick Square, E.C.4, or Mr. Josiah Green, The Council House, Bristol. 21s. with map in separate case; 17s. 6d. without map; map published separately, 5s.

Thames Valley Survey. University of London Press, 10, Warwick Lane, E.C.4. 21s.

Berkshire Regional Planning Survey. Bradley and Son, Ltd., Caxton Street, Reading. 7s. 6d. (postage 6d. extra).

South-West Lancashire Joint Town Planning Committee Report. Messrs. Hodder and Stoughton, Ltd. 21s. with map, 10s. 6d. without map.

The New Survey of London Life and Labour: The Preliminary Volume as an Example of the Co-ordination of Information.

By L. C. MARSH, B.Sc. (Econ.),
Assistant Secretary to the Survey.

It is desirable at the outset to explain briefly the origin and character of the Survey as a whole and the relation borne to it by the first volume to be published.

The pioneer work of the Rt. Hon. (then Mr.) Charles Booth in social and economic investigation, applied at first to the " East End " of London only, was begun as far back as 1886: but the Survey being supplemented by inquiries into London's industries and into a great variety of agencies and influences affecting " the Life and Labour of the People," and extended in scope to the whole of London, it was not until 1903 that the final volume appeared. The London discovered and described so uniquely by Charles Booth, that is to say, was the London of the 'nineties.

After the war, there was general agreement among all those who knew the results of Charles Booth's great work, as to the value that a new survey made on the same general lines would have, since it would not only give a complete picture of the general condition of the people to-day, but would enable comparisons to be made with conditions forty years ago. The finance and organisation necessary for such a vast piece of social research having been secured through the initiative of Sir William Beveridge and the London School of Economics, work was begun two years ago.

One of the first tasks of the Survey staff was to provide some link between the time of the original investigations, and to-day, as a " control " and a background for the new survey proper, in view of the fact that it was undertaken after the lapse of so long a period, —a period, moreover, which had seen the great change brought about by the war. It was proposed to perform this task by compiling a number of measurable indices extending from the time of the Booth Survey to the present, which together would permit a quantitative estimate of the relation between general economic and social conditions to-day and forty years ago, and which at the same time might indicate those aspects of London life and labour to which attention should, in the Survey proper, be more particularly directed by reason of their having acquired a new or greater importance to-day.

The subjects finally chosen to cover this ground, each of them forming the material for a chapter or chapters, in what is now the first volume of the New Survey (entitled " Forty Years of Change ") are:

(*a*) The population of London, its composition (by age and sex), distribution and origin (birth places, etc.);
(*b*) Cost of living, wages, earnings, and hours of labour;
(*c*) Rents, housing, and overcrowding;

(*d*) The occupations and industries of London (changes in numbers employed, etc.);
(*e*) Travelling facilities;
(*f*) Health (changes in the mortality from certain groups of diseases, and the growth of the public health service); the growth of elementary education; public amenities (parks and open spaces, theatres, libraries, etc.), and disamenities (traffic congestion, smoke, etc.);
(*g*) Unemployment (amount and treatment); poor relief and pauperism; and crime;

and the task of drawing together the general conclusions was undertaken by the director and editor (Sir Hubert Llewellyn Smith) in an important introductory chapter.

The problems which arise in using and interpreting long-period data of this type and in welding them together so far as possible into a related whole are, of course, well known to those who have handled them. But their number and extent for such a wide range of topics, each with its particular statistical problems; over so long a period of time, extending in some cases beyond the date at which reliable published information first appeared; and for so protean an area as London, which has a dozen different sizes for different times or subjects,* are not likely to be easily realised by those who read the results. To assist in meeting these difficulties a number of experts in their particular subjects co-operated with Sir Hubert and Professor Bowley. Thus Sir William Hamer was responsible for the chapter on heatlh, Sir William Beveridge for the chapter on unemployment, and Sir Edward Troup for that on crime.

The general interest of such a volume, dealing with the most immediately important aspects of communal life, needs no emphasis. But the special or technical interest of the work, with which this paper is primarily concerned, is that it is a particularly important example of the measure of success attainable in bringing together and interpreting certain basic sets of data, gathered from a variety of sources and differing widely in their availability, frequency, and reliability. How the necessary statistics were obtained; how far available primary sources had to be manipulated and how far supplemented; and what were the gaps in the information required—all these problems are clearly illustrated in the volume, as well as the methods by which they were solved. And to those who read the first volume as a type of contribution to the investigation of social and economic conditions for which there is a definite need, two questions are likely to occur. How far would it be possible for such work to be undertaken for other important towns? It is true that London, as being the metropolis of the British Empire and the largest urban area in the world (as well as one of the biggest industrial areas), has a special importance. It also has certain advantages—such as those represented by the practice of isolating the data for London† in a number of series of published statistics, and by the

* The area which has been chosen for detailed survey (the "Survey Area") is of course definitely fixed, but in using available material, acceptance of the particular area to which it relates is usually unavoidable.

† Or rather, *a* "London."

compilation of information relating specially to the county which has been undertaken by the L.C.C. since 1899—which make London in some ways more easily the subject of survey. But there are a large number of other towns for which, by reason of their special interest—*e.g.*, as the seat of certain types of industry—similar work would have great value. And a growing number of towns are now being made the subject of static surveys similar to that taking place at present in London.* A second and obviously related question which is likely to be asked is : How far is the continuation of at least the main series compiled for London desirable and practicable ?

Some account of the actual sources used in the volume which the New Survey has just completed may now be given with the above considerations in mind. It is impossible within the limits of this paper to deal with the detail of every chapter, but it may be useful to mention the more important of the materials employed, and their sources may be conveniently classified into four broad groups : (*a*) " official " sources, or information, the collection of which has been the work of a public body (*e.g.*, a government department or a local authority) ; (*b*) information collected by or obtainable from such a body, but not existing in published form ; (*c*) and (*d*) " non-official " sources, or information compiled by private persons or non-public bodies, which again may (*c*) or may not (*d*) be published.

(*a*) " Official " Published Information.

The greater part of the material used in the Survey's first volume was drawn from this source. In very few cases, however, did this mean that it existed in the exact form required, though this again was not always a ground for criticism. The large scale " official " statistical undertakings, of which the population census is the foremost example, cannot well be much more than masses of material from which summaries, or details for certain areas, must be taken separately by the investigator. The decennial censuses were the largest single " official " source used, and all the relevant information that these would yield was extracted for the purposes of the chapters on area and population (growth by " rings " and by boroughs age and sex-distribution, density maps for 1891 and 1921, birthplaces etc.), on occupations and industries, and on housing (tables compiled from the information as to the number of occupants per room in small dwellings, included since 1891). The chief difficulty, that of securing comparability as to classification, content, and area, was so general to every subject in the volume that it must be mentioned at the outset. But none deserves more to be singled out for special comment than the extreme case of occupations and industries. For information so fundamental as this, the change from an occupational to an industrial classification in 1921, change from classification by place of residence to classification by place of work, and the impossibility of using one area of reference throughout, maximised the difficulty of tracing the nature of the changes since 1891 ; and only the careful use of the 1911 figures (which were given experimentally for industries as well as occupations) as a " bridge," considered choice of areas, and the supplements of material specially analysed by Charles

* *e.g.*, Liverpool, Sheffield, and Southampton.

Booth in 1891 and (" insured persons ") figures specially supplied by the Ministry of Labour, enabled any comparisons to be made at all.

A source which should be mentioned second, less well known than it deserves to be, but of the greatest value to the Survey, was that provided by the volumes of " London Statistics," compiled by the London County Council. The present annual volumes have grown from what were mainly collections of the Council Papers in the 'nineties. Much less systematic and useful in these early years, they are now comprehensive volumes of the statistics relating to the great range of activities and interests of the County Council to-day. An interesting set of data which really belongs under this head and which was combined with information from other sources, was that of the early schedule of rates of pay and hours of labour recognised by the L.C.C. and issued in connection with the " fair wages " regulations for public contracts : Nowadays the *London Gazette* from time to time gives an extensive list of the rates and conditions current in London trades.

To return to material from Government Departments, that published originally by the Board of Trade and since 1919 by the Ministry of Labour, should be noted next. This related in particular to cost of living, wages, and unemployment. For all these separate indices for London had to be specially compiled, and both the nature of the sources used and the aid they gave in compilation, differed as between the earliest years (before 1890 or 1894), the period from these years to the war, and post-war years. In the main, however, the indices were compiled from source (*b*), but published information which could be used directly was found in fragments which had to be built in to the material specially obtained—*e.g.*, data for a limited extension of the cost of living index beyond 1890, from the Second Fiscal Blue Book ; * or for the wage-rate index before 1894, from the Reports on Trade Unions and on changes in wages, of these early years. In this group the one series of comparable data directly obtainable from published sources was that relating to unemployment (for certain trade unions only, however), given monthly in the Labour Gazettes since 1893 : but this it was not practicable to use for the post-war years. On the other hand, material to give an indication of the trend of earnings (as distinct from wage-rates) in London was greatly deficient. Before the war there were only the two inquiries of 1906 and 1886—the systematic character and ready " usability " of the former, an extreme contrast to the lack of uniformity in presentation and definition in the latter—while the figures obtained from these could only be compared over a similar interval of time (1924 and 1928), and, once again, only by means of material specially supplied.

In most of the other chapters in which information from official published sources was employed, the writers profited from the circumstance that a London area is distinguished separately for the purposes of administration, and therefore for the figures normally published. Chapters to which this applies are those dealing with Crime—the Metropolitan Police area being nearly coincident with Greater London ; Education—for which the School Board for London was, and the L.C.C. now is, the most important administrative body

* Cd. 2337 of 1904.

in the country; Health—the County and Borough Medical Officers for London presenting reports annually, and some separate figures for London being given in the Registrar General's reports; and Pauperism and Poor Relief—separate figures for the Metropolitan Unions being collected and published by the Local Government Board, long before 1890. In very few cases, however, has the Survey been content with such series, or indeed, have such series been sufficient for a balanced account of the changes which have occurred: the chapter on health, for example, uses a detailed series of mortality figures specially compiled with the aid of the Registrar-General's department, besides a number of references which may be classified under our heading (*c*). In the whole volume, the supplementary information obtained from the publications of departments or from Government inquiries range from assessments of rental values in London made by the Board of Inland Revenue to indices of atmospheric pollution compiled by the committee on that subject attached to the Department of Scientific and Industrial Research.

(*b*) Material from Official Sources not Normally Published.

The extent to which this class of information has been sought and obtained has already been indicated, and the experience of the Survey is that the completion of any work of the character of its first volume is impossible without the co-operation of those governmental and local authorities who are able to supply statistical information on particular subjects. In some cases—*e.g.*, for information as to parks and open spaces, libraries, and other " public amenities "—the material used by the Survey could only be obtained in this way (in this case from the County Council and the Borough Councils). For several other chapters the data thus supplied constituted a major part of the basic material. The Survey was supplied by the courtesy of the Ministry of Labour with the post-war data for the cost of living index, including information relating to rentals used in the chapter on housing; a large part of the data of hours of labour and wage-rates used for the wage indices; unemployment insurance material for post-war years from which unemployment percentages were calculated for the chapter on unemployment, and a table of the changes in the insured personnel of industry for that on occupations and industries; besides the information for a number of smaller points, such as, *e.g.*, the change in the average rate of trade union subscriptions since Charles Booth's day. Other examples of Government Departments who have assisted the Survey, and the diversity of the inquiries concerned, are the Board of Trade, the Customs and Excise Department (the production of beer in London), the Ministry of Transport (traffic congestion), and Meteorological Office (changes in the average amount of sunshine and fog). And, thirdly, the Survey has at a number of points benefited from supplementary information and expert advice placed at its disposal and incorporated into the chapters. The example which may best be singled out for special mention is that on housing, to which the contribution of the L.C.C. Housing Department was considerable.

(*c*) Non-Official Published Sources.

Pride of place among these sources for the Survey as a whole

must, of course, be given to the seventeen volumes which comprise Charles Booth's great work. These not only provide the basis from which comparisons may be made, but also the material from which comparable procedure and standards for the Survey proper* have had to be decided. Besides the fact that some of the material from the Booth volumes—*e.g.*, his special analysis of the figures obtained from the occupation census of 1891, has been incorporated in the preliminary volume of the New Survey, it is very apposite to recall here that some of the information now existing in " official " published form is so obtainable as a result of the suggestions or request of Charles Booth himself. The census statistics of the number of rooms occupied by families living in tenements of four rooms or less (enabling " overcrowding " percentages to be calculated), of which the Survey has made full use, are the outstanding example.

Besides Charles Booth's volumes, the most important of the diverse sources which fall under this head are the underground railways, the main-line railways serving London, and the L.G.O. Co., who supplied the information which, added to that furnished by the L.C.C. for London tramways (and from " London Statistics," mentioned above), gave the necessary background for the chapter on travel and mobility, and enabled estimates to be made of the change in the cost of working class travel which were needed in the cost-of-living chapter. Much of this information, indeed, not having been previously published, must be considered as having been derived from the fourth of our classified sources.

Material published by non-official bodies (*e.g.*, the British Medical Association, in the chapter on health) or private persons (*e.g.*, Professor Cyril Burt, on juvenile crime), was necessarily used or quoted in a number of places.

(*d*) " Non-Official " Information not in Published Form.

This final " source " is (as is also in some ways the third), a measure of the gaps in organised information which still exist. The Survey itself, indeed, exists to increase the amount of information on certain subjects in published form. Even some of the material of the first volume, as distinct from the survey proper, belongs to this category, since it had to be obtained by *ad hoc* inquiry, from persons or bodies possessing the requisite knowledge. The example of most interest which may be mentioned arose in connection with the chapter on cost of living in London: for which information was needed, and was obtained by special inquiry as to the cost of certain items in both " necessary " and " non-necessary " expenditure—*e.g.*, oil, for a number of years for which no " official " figures existed; and beer, tobacco, theatre seats, and trade union subscriptions to-day and forty years ago.

It would be too much to claim that the preliminary volume of the New Survey is unique: but it may be claimed that publications of this type are few and infrequent enough for it to deserve discussion. This paper can claim no more than to have indicated briefly the nature of the work involved, and to have raised a number of points

* On the problems of choosing a comparable area, of calculating a comparable poverty line, and defining anew the " A to H " grades, see the article by Sir Hubert Llewellyn Smith in the *Journal of the Royal Statistical Society*, Pt. IV, 1929.

for discussion, to which the experience of the Survey may have something to contribute. On some of them that experience leads to fairly definite views.

For an adequate account of all the important aspects of life and labour at the present time official sources, while vastly better and fuller than they were forty years ago, are still by no means sufficient, and even these are not safely to be handled by the non-expert. Apart altogether from the question of expense the time and skill needed are still the chief obstacles to securing continuous compilations of such basic data for units smaller than the country as a whole, although yet another difficulty—the long period between some of the major statistical compilations such as the population census—is so obvious that it has not been repeatedly mentioned above. Again, the compilers of the volume which is the subject of this paper would be among the first to emphasise that such compilations are no substitute for detailed survey proper—rather that their value is realised only when they function as links or background. If it is accepted that accurate knowledge is a first and very definite step in social progress, a great number will be found to agree that the ideal to be aimed at in an era of increasing industrialisation is a series of surveys for London and for other towns—at, say, intervals of fifteen or twenty years, linked by a continuous series of the more important indices of social and economic conditions. The volume which marks the completion of the first part of the work of the New Survey itself, demonstrates how far from this ideal we yet are, and what is the nature of its difficulties, but if it serves to stimulate the issue and organisation of information by local authorities—to encourage, for instance, the L.C.C. yet further to amplify the work in this direction in which it already takes a leading part, and, outside the " official " sphere, to lend support to the work of organisations such as this ; it will also have done something to bring this ideal nearer.

Contd. from page 76]
measure progress or otherwise ; and (3) the comparative study of many such objects to establish standards of average quality or possible excellence. Information collected for one purpose was frequently valuable for others and when engaged in (1) contributions should be made also to (3) and perhaps (2), but the organisation of the study should be based on the purpose, and, for example, a mass of data should not be thrust upon the technical planner merely because they had some other value. Speaking of the presentation of information, Mr. Unwin remarked that for planning purposes there was more value in graphic and approximate facts than in statistical and exact.

Professor Pollard said that since the desired information extended over such a vast field and required special preparation before it was of practical use to the surveyor, it would in his opinion be necessary to attack the problem in a carefully-considered manner.

To deal with the matter efficiently, he suggested that the four following and outstanding activities at least were desirable :

(1) A permanent committee to act as the executive and advisory body in the whole matter.
(2) The determination of a systematic method of filing and finding the information collected.
(3) A " Central Repertory " in which the information was filed in accordance with the systematic method adopted.
(4) A " Statistical Office " with access to the Repertory for preparation of the information for immediate use by the surveyor.

Mr. Donker Duyvis, Mr. L. C. Wharton, Mr. G. H. F. Smith, Mr. E. A. Martin, Alderman Squire, and Sir Frederic Nathan also took part in the discussion.

Regional Survey as Pure Research.

By C. C. FAGG, F.G.S.

My first close acquaintance with ASLIB and its work was made at the Conference at Cambridge last year, when I was impressed not only by the vitality of the organisation, but also by the very many points at which its activities touch the interests of regional survey workers. Upon reflection one sees that this should be no matter for surprise, for one half of the task of a regional survey organisation consists in gathering together and digesting the great mass of information concerning the chosen region that is already available. The other half of its task consists in supplementing this by fresh information extracted from the region itself and in correlating the whole so as to produce as complete a picture as may be of the region and its plant, animal, and human inhabitants both in its past history and at the present time, and from this to indicate its future possibilities. I shall not venture to make any specific proposals for the closer co-operation between regional survey organisations and ASLIB, but I will do my best in the time at my disposal to tell you something about regional surveying and its special technique and leave those concerned to think the matter over.

A regional survey may be undertaken from either or all of three motives. It may be regarded as a piece of pure research, as a method in education, or as a preliminary to the formulation of a scheme of civil improvement or development—a town or regional plan. Mr. Pepler has already dealt with the latter aspect of regional surveying with an experience and authority that I could not bring to bear upon it. Not being a member of the teaching profession, I shall not venture to say much about the application of regional survey methods to educational theory and practice, important as these have already shown themselves to be. I shall devote my time to giving you some account of regional surveying as an organised movement in a very wide field of research ranging from geology to sociology. In regional survey the region is the object of study and is the factor which correlates and unifies all the special branches of science in a manner roughly indicated in this conspectus diagram (exhibited at the meeting).

A regional survey undertaken for its own sake has some advantages over the survey for planning and the educational survey. The town planner has to produce a plan, and this by a given date. Considerations of time and cost necessitate his confining his survey activity more or less to lines of investigation which have a direct bearing on the problems of planning. He is not concerned, for instance, with the type of stone implements that occur in a particular gravel, the contents of a tumulus, the local place names, or a host of other things of interest to the regional surveyor. A society undertaking a regional survey for its own sake is untrammelled by considerations of time or utility. Its members can browse about their survey area with that sense of leisure which is essential to the student, and follow up any line of investigation that presents itself. Whatever results the

individual achieves will find their proper place in the accumulating survey material, and posterity will carry on.

Surveys of this kind have been initiated in various centres by parties emanating from Leplay House, and examples of work from some of these (Chester, Chichester, Taunton, Ludlow, etc.) are exhibited around the walls. Such surveys are also being made by many local societies, particularly in the south-eastern counties, where they have been encouraged by the Regional Survey Section of the S.E. Union of Scientific Societies.

Let us first endeavour to get an idea of the deeper significance of regional surveying. The term " regional survey " is of modern usage, having been introduced by Professor Patrick Geddes in 1897. The regional survey movement as such owes its inspiration in large measure to Professor Geddes, who is at once biologist, psychologist, sociologist, and town planner. Its development has been most marked during the present century, and particularly during the last decade. But if the self-conscious movement is modern, regional surveying is as old as animal life, of which, indeed, it is a constant function. It is, in fact, a necessary and highly important part of the technique of living corresponding with what the psychologist terms " cognition." The human infant knows nothing of the movement, but it commences its career as a regional surveyor from the moment of birth and appears to object strongly to its first discovery of the atmosphere. If you change your residence and happen to take with you a cat you will observe that immediately upon arrival it embarks upon an intensive survey of its new environment, and does not rest until it has completed the task to its satisfaction. I have no doubt that the cat discovers many things in the course of its survey that do not impinge upon the blunter senses of its human companions. It is to be regretted that these cannot be communicated. The instruments and technique of regional surveying vary widely with the different species of animals. The amœba extends its pseudopodia, the ant finds its way about largely by the sense of smell, while we make the greatest use of our visual organs. For us, seeing is believing. Hence we have come to call the organised science of investigating our environment Regional Survey—literally seeing over our region. I think it is worth while reminding ourselves of the age-long existence and universality in animal life of the function of regional surveying, if only to dispel the notion that regional survey is some new-fangled stunt clamouring for a place in the sun.

The cat, with its comparatively simple needs, finds memory an adequate storehouse for the results of its regional researches, whereas we, with our complex reactions to environment and our need, as members of a co-operative community, to exchange knowledge and hand it on from generation to generation, have invented means of externalising our memories and making their contents available for others. This is where the information bureau comes upon the scene to fulfil not merely a useful, but in our age an increasingly imperative function. The information department of a business house is engaged in region survey work, though its region is usually a wide one. I am informed, for instance, that tea merchants find it necessary to study the quality of the water supply in different localities in order to send them appropriate blends of tea. A few years ago the manager of the

A REGIONAL SURVEY CONSPECTUS AND NOTATION.*

000 General Results and Interpretations of the Survey.
- 010 Geographical Position and Environs of the Region.

Methodology and Technique of Surveying.
- 020 Books, Maps, Records, Illustrations (Bibliography).
- 030 Information concerning Maps.
- 040 Methods of Surveying Rural Areas.
- 050 Methods of Surveying Urban Areas.
- 060 Methods of Surveying Maritime Areas.
- 070 Methods of Recording, Illustrating, and Exhibiting Results of Survey.
- 080 (Open).
- 090 Theories and Methods of Interpretation.

100 The Earth's Crust (Geology).
- 110 Strata of the Region and their Sequence (Stratigraphy).
- 120 Geological Structure of the Region (Tectonics).
- 130 Physical and Chemical characters of Rocks (Petrology).
- 140 Mineral Contents (Mineralogy).
- 150 Fossil Contents (Palæontology).
- 160 Economic Geology.
- 170 Soils and Subsoils.

200 Atmospheric Phenomena (Meteorology).
- 210 Pressure and Wind.
- 220 Rainfall and Humidity.
- 230 Sunshine.
- 240 Temperature.

300 Surface Features and Natural Drainage (Orography and Hydrography).
- 310 Relief and Bathymetry.
- 320 Rivers and River Basins.
- 330 Lakes, Ponds, Bogs, Marshes.
- 340 Underground Drainage and Springs.
- 350 Erosion and Deposition.
- 360 Sea Coasts.

400 Vegetation (Botany and Plant Ecology).
- 410 Woodlands and Scrub.
- 420 Moorland and Heath.
- 430 Grassland.
- 440 Fen and Freshwater Marsh.
- 450 Aquatic Vegetation.
- 460 Saltmarsh, Dunes, Shingle.
- 470 Marine Vegetation.
- 480 Life-histories of Species in relation to environment.
- 490 Floristic Lists.

500 Animal Life (Zoology and Animal Ecology).
- 510 Terrestrial Surface Animals.
- 520 Aerial Animals.
- 530 Animals intimately associated with terrestrial plants.
- 540 Subterranean Animals.
- 550 Freshwater Aquatic Animals.
- 560 Marine Littoral Animals.
- 570 Marine Animals.
- 580 Life-histories of Species in relation to environment.
- 590 Lists of Fauna.

600 Prehistoric Man (Prehistory).
- 610 Pre-Palæolithic.
- 620 Palæolithic.
- 630 Neolithic.
- 640 Bronze Age.
- 650 Early Iron Age.
- 660 Prehistoric Earthworks, Megaliths, Roads, etc.

700 Historic Survey.
- 710 Roman Occupation.

* Reprinted from "An Introduction to Regional Surveying," by C. C. Fagg and G. E. Hutchings, by permission of the Cambridge University Press.

720 Early English.
730 Norman.
740 Late Mediæval.
750 Renaissance.
760 Post-Renaissance.
770 Industrial Period.
780 Period of the Great War and later.
800 Economic Survey.
810 Population (number, distribution, anthropometry).
820 Land (tenure, ownership, utilisation, value).
830 Agriculture, Forestry, Fishery.
840 Mining and Quarrying.
850 Manufacturing Industries.
860 Engineering and Building.
870 Communications and Transport.
880 Distributive Industries (markets, shops, etc.).
890 Finance.
900 Social Survey.
910 Occupations.
920 Housing and Public Health.
930 Government and Administration.
940 Military and Naval Organisation.
950 Education.
960 Recreations (sports, games, etc.).
970 Language and Culture.
980 Ecclesiastical and Sectarian Organisation.
990 Religion and Religious Influences.

Pluvius policy department of a well-known insurance company joined the society conducting the Croydon regional survey for the sake of obtaining its rainfall records.

The regional surveyor has a voracious appetite for all existing information regarding his region, and he appreciates to the full the special section of his public library devoted to collecting this information. In Croydon, as in many other centres, we are excellently served in this respect, but there are still many libraries that pay little or no need to this important side of their work.

It is perhaps desirable here to make some comments upon the concept " region " in regional survey. In common parlance the word has a wide range of application. We speak, for instance, of the arctic region or the lumbar region where we get lumbago. Town planners speak of town *and* regional planning, but planning and surveying are not quite the same. When a town plan is called for it is preceded by a survey which takes full account of the surrounding region of which the town itself is regarded as the nucleus. It is not the planner's fault if the plan is only for the town. The dictionary will indicate that the term regional is properly used in antethesis to local, and in this sense the great majority of regional surveys now in progress should be styled local surveys. The late Professor Herbertson, of the School of Geography in this University, rather objected to the use of the title " regional surveys " for what he would have preferred to call " district surveys," but the former term has become well established and is used even if the area under survey is only a single parish. Nor is its use entirely without justification; for it is the breadth of outlook in regional survey that distinguishes it from mere topographical description. It is true our survey areas do not as a rule merit the title of regions, but even the smallest of them is set in a true region, and its study from this standpoint may

legitimately be called regional survey. A survey area, then, may be anything from a single rural parish to, say, a river basin containing many civic centres according to the nature, strength, and resources of the organisation undertaking the survey.

Having decided upon a survey area, large or small, the task of a survey organisation is to find out all there is to be known about it and to bring the information from all sources together and present it in an orderly form and, above all, in a concise form. In his Herbertson Memorial Lecture in 1921 Dr. Hugh Robert Mill said: "In geography we may take it as an axiom that what cannot be mapped cannot be described." This is not quite true of regional survey, but it is surprising to what extent the data collected in the course of a survey can be expressed in the form of maps, so long as we do not attempt to show too much on a single map and choose a scale appropriate to the subject. The map, whenever its use is possible, is without doubt the most accurate and concise method of recording regional observations. The basis of the records, therefore, in every regional survey is a collection of maps, and the number that may be prepared is almost unlimited. They will, of course, be supplemented by graphs, tables, written matter, and photographic illustrations. It is usual to have a stock of what are called base maps of the region specially printed in grey ink by the Ordnance Survey, to which the records may be added in coloured inks or washes. I have here a portfolio containing some of the maps of the Croydon survey, and we may perhaps glance rapidly at its contents. [This was exhibited at the meeting, special attention being drawn to the scientific value of surface utilisation surveys.]

It will be observed that the maps cover a wide range of subjects, and the need for some form of indexing notation is soon felt. Some years ago the Regional Survey Section of the S.E. Union of Scientific Societies, in conjunction with the Regional Association, now merged in Leplay House, gave very careful consideration to this question, and concluded that while the decimal system of indexing was admirably suited to our purpose, the Dewey classification was of no use to us, and we adopted the classification which follows. Its nine main headings are based upon the logical arrangement of regional phenomena as set out in the conspectus diagram [exhibited]. The first three categories deal with the physical aspects of the region; the next two with the biological; and the last four with the human life, prehistoric, historic, economic, and social.

We simply cannot help arranging our maps and records in this order, and it would have been folly to have applied to them a notation that would not have been in numerical sequence. The order of the subdivisions is in some sections more or less arbitrary, but in each case it was settled after careful consideration and consultation with experts. I do not know how far it is possible to add the Brussels notation to our categories, but I should feel very grateful to Dr. Bradford if he would make the attempt. I fear it will be a little difficult in some cases; for instance, the subdivisions of plant and animal ecology. The initials (R.S.) should precede each number in this series to avoid confusion with the Brussels notation, which is of much wider application.

For the purpose of regional survey maps and records I am personally

of the opinion that a sufficient degree of standardisation is achieved by carrying the classification to two figures, the third and subsequent subdivisions being left to individual survey organisations. For instance, the third figure in stratigraphy " 110 " would naturally be utilised to denote specific geological formations which differ in different survey areas.

The sources from which the regional surveyor obtains his information fall under two heads. First, all that has previously been recorded about his area in books, maps, pictures, and documents of all sorts, and second the region itself. It would be difficult to say which of these is the more important. Notwithstanding the vast amount of written records concerning any area in this country, there are comparatively few maps that can be completed satisfactorily without further observations in the field, and a great many that have to be based entirely upon new survey work. In any case, an intimate acquaintance with the region itself, as well as with its literature, is essential if the surveyor wishes to discern the relationship of cause and effect between the varied phenomena of his region.

The whole object of a regional survey is not encompassed by the amassing and recording of observations. It is necessary that these should be correlated and, as far as may be, interpreted. So far as organisation is concerned, the ideal of the R. S. movement is to have a parish survey in every parish, to have these grouped together under town organisations into what we may call local surveys, and these again into larger group organisations that may properly be called regional surveys, covering the whole country. On the cultural side I think the aim of the movement, though it is not so understood by all its devotees, is to provide an observational basis for a true science of sociology. The Newton or Darwin of sociology has yet to make his appearance. I think we may safely predict that he will emerge, if at all, from the ranks of regional surveyors, or at least that he will build upon the results of their work. For a sound sociology must not only take account of human communities and their institutions, but also of their intimate and subtle reactions to their whole environment. A penetrating historian will perhaps someday discover that regional surveys, like information bureaux, have been called into existence by the needs of our modern situation. When we reflect upon the triumphs that have already attended the applications of scientific research in the realms of physics, chemistry, biology, and medicine we may perhaps reasonably anticipate the emergence of a better social order when the results of scientific research in regional sociology can be fully applied to the arts of statesmanship, and administration on the one hand and education and citizenship on the other. In the meantime regional research and planning in its widest sense may we hope continue to react beneficially upon one another in what we may venture to term a virtuous circle.

DISCUSSION.

The three foregoing papers were presented at one meeting and were discussed together. In Mr. Marsh's absence his paper was presented by the CHAIRMAN (MR. RAYMOND UNWIN). Mr. Unwin spoke about the purpose for which information is intended as affecting its character and selection, and mentioned three classes as examples: (1) the study of an individual subject for the purpose of adapting something to it; (2) the comparative study of such subjects at two periods to

[*Contd. on p.* 70

The Technique of Information in the Training of Students: Technical Institutions and Libraries.

By G. F. O'RIORDAN.
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The Association of Special Libraries and Information Bureaux includes in its proceedings several contributions on the Library in relation to teaching services in general, but apparently no serious attempt has ever been submitted to suggest the urgency and the absolute necessity for the inclusion of a suitably well-equipped and organised Library as an integral part of the larger technical institutions and Polytechnics of this country. Probably this omission may be attributed to the general failure to appreciate the true function of a technical college. It may be due to lack of knowledge of the requirements of a technical college. It may be due to lack of healthy co-operation between the colleges and the various local activities. It may be the outcome of a difficulty of not having sufficient accommodation and finance to house and purchase such specialistic form of literature, together with the provision of the efficient type of Librarian required to organise so important an adjunct of this national institution.

Statistics reveal the fact that the importance of the instruction and curriculum of a technical college was only brought into prominence during the course of the war. During the war, cabinet ministers paid tribute in the most glowing terms to the incalculable value to the nation of the work of technical colleges, and unanimity of opinion was then expressed that these colleges with their special bias and training should receive the strongest encouragement in the future and be equipped with the best the nation could afford. It is only recently, however, that these promises have been partially fulfilled, and in this respect, probably Lord Eustace Percy has done more to foster and develop technical education than anyone else. Certainly under his reign at the Board of Education, technical colleges throughout the country have made extraordinarily rapid progress, which will continue unless impeded by some unforeseen catastrophe or change of Government policy.

There are, of course, various kinds of technical institutions, some are large, some are small, and their status naturally depends on local circumstances and the nature of the co-operation which exists between themselves and local industrial concerns. In most industrial cities, a good technical college has been established. In the British Isles, there are approximately 180 technical colleges, while in London alone, there are 30. The cost of education for the whole country is in the nature of £46,000,000 and of this £4,000,000, or ten per cent., is attributed to technical education.

The technical college, or local college, as it is sometimes termed, is in no sense a trade school; nor is it an institution which enables a student to add to his weekly earnings by obtaining additional specialistic skill in operative work.

A trade school is a separate type of institution organised for training post-elementary school children before entering factories or works as operatives. The more ambitious do reach a technical college and ultimately obtain a remunerative position of control in industry; but a technical college is an institution of an advanced character, in which the basic principles of industries and manufactures are taught by a highly qualified staff of teachers, who, in addition to their academic qualifications, have special practical experience acquired as a result of many years of association in positions of responsibility in industry. The difficulty of obtaining a supply of efficient teachers of this type is gradually being overcome, and in this, no doubt, the improved Burnham salary conditions have done much towards attracting the right type of specialist applicant into the teaching profession. Some technical colleges have attached to their organisations a junior technical college or commercial school for boys, and sometimes girls, from twelve to sixteen years of age, each providing a liberal education with an industrial or commercial bias.

The curriculum very closely resembles that of a secondary school, but some subjects are treated from the industrial aspect, while additional subjects of an industrial character are included. In most cases, the products of these schools are given preferential consideration in entering industry, and some are earmarked for subsequent part-time day technical training during works time—and often at their employers' cost—in conjunction with organised evening studies; generally positions of the works foreman and superintendent class are selected from these. The influence of the industrial atmosphere of the college on the youth's outlook is stimulating, and it is not surprising to find a considerable growth of such schools throughout the country, and more recently, the gradual introduction of the technical curriculum in secondary and some public schools. In larger cities, no single building can adequately house both the junior technical school and the technical college proper, but, although they may be in separate buildings, a most intimate co-operation exists between the heads of the institutions and their governing bodies. The average student in the local college comes from the secondary school and public school, and attends a full-time day course extending over three to four years. Some have matriculated, others are in possession of the corresponding exempting certificates. The curriculum is designed to enable such students to enter an industry in which they are interested with a thoroughly sound knowledge of the fundamental scientific principles relating to that particular industry.

Such instruction is generally of high academic standard, in several cases corresponding at least to that of a first-class honours modern university degree standard, but having the outstanding important advantage of an industrial bias in addition to a study of the economics of that industry. In this, it is regular for students, having graduated by taking a good degree under internal or external conditions, to proceed for industrial experience, but frequently they return to the local technical college as evening students or part-time day students for post-graduate courses of further advanced specialised study, while some engage in post-graduate research for higher degrees. Many, for instance, employed in chemical industries, undertake research and schemes in the technical college laboratory on small

scale before issuing a report to their Board of Directors. It is, therefore, quite obvious that a large technical college is, in reality, an industrial University, and Lord Eustace Percy was quite right by suggesting that the time is not far distant when the University will include and regard the technical college as the industrial side of its organisation. Such a suggestion should save much waste of public money and effort, and contribute considerably towards the development of our industries.

These introductory remarks, which are submitted to serve the purpose of outlining the scope of technical colleges, should be sufficient to enable one to appreciate the enormous field covered by such colleges. If the nation is to prosper and hold its proper position in industry and manufacture, nothing should arise which might hamper or hinder the basis on which this progress largely depends. Towards this end, it is a paramount duty of those who are responsible for the organising of the scientific and commercial courses, as well as the duty and responsibility of the technical staff who provide the instruction, to keep familiar and conversant with the latest developments and progresses in industry and with the results of research and reports and recommendations. It is quite inadequate for the technical teacher to be content with instruction based on his past industrial experience ; he must move with the times, and he must be a source of constant inspiration to his students. This frequently is a condition of his appointment. In the fulfilment of their duties as technical teachers, by the terms of their agreements, a minimum number of hours of teaching is demanded which practically precludes them from devoting much spare time to the visitation of works, to the visitation of libraries and other sources of information. Some, however, generally to be found as heads of departments, practically give their lives to the institution not only by meeting the above requirements, but conducting academic research and testing for various concerns. Without the proper reference library and the sympathetic co-operation of the librarian, it would be almost impracticable for a staff of technical teachers to fulfil these chief demands, and yet how unusual it is to find sympathy exhibited by those in authority to make such a policy possible. A workman cannot perform a first-class job with obsolete and unsuitable tools ; neither can a teacher provide the substance of his stimulating lectures without a proper library. As I have already stated, in the whole of the British Isles and the Dominions, there are practically 180 recognised technical colleges. Thirty of these are in London, and some ten exist in the Dominions. Of these figures, approximately twenty-three may be called major technical colleges—*i.e.*, colleges conducting research and instruction of the highest grade. Of this number, comparatively few can boast of a really good Library. How, then, is it possible, with these existing arrangements, to keep abreast of the times and bring about the inspiration and contentment in a staff, of the type to which I have referred ? Some technical libraries are content with a collection of old text books under the supervision of a junior inexperienced member of the staff, who wisely keeps the books locked up ; for, otherwise, they would cause more depression than stimulation to the average student.

In some cities, an arrangement has been agreed between technical colleges and the city library committee whereby a small section of

the Public Library is set aside for specialistic books of reference, but, here again, while the City Librarian is always too willing to devote his energy for the best, he has the general public to consider first, whose demands generally constitute literature of a light type and works far removed from technical study.

It is unfortunate that local city councillors do not take a bolder and courageous outlook (even at the risk of losing their seats on the council) and advocate through a slight increase in rates, the purchase of the library with its quota of technical reference books, together with a source of revenue for its general maintenance. True, such money would be devoted to a class of literature restricted in character, and, therefore, of not universal public use, but it is on the energy, efforts, and study of the few for whom such restricted literature is required that the prospects of advancement of the city would depend. Doubtless, the leaders of the various local activities would regard this a wise policy and good investment, which they could be persuaded to augment by subscription. A technical library building would probably cost £3,000 to £8,000, depending on its size. A nucleus of books could be obtained for about £1,000, and £100 to £300 a year would comfortably keep a library properly equipped with additions. A librarian would claim another £300 to £400. Surely the spending of so small a sum involving such great facilities is worth considering, and yet, £30 to £50 a year is an average contribution to a technical college library. It is desirable, on the whole, that this specialistic library should be a part of the technical college, rather than an annexe of the city library. Students who have got to that age of enquiry, after having attended a technical college, have become associated and familiar with technical college organisation, and a mutual sympathy exists between these students and staff. The college is usually the centre of their local activities, and, therefore, it would appear that present and past students could find no better and appropriate centre for their researches and enquiries than in the technical library at the technical college, in consultation with the librarian. For old students especially, who have left the city to conduct their work, nothing could be more effective for them in the collection of information than from the library with which they have devoted so much time.

The selection of books of literature requires the most careful thought and experience. Most of the technical colleges specialise definitely in one or more departments. Some specialise in several, but the size is governed in general by the local conditions. Bradford is interested in textiles, engineering, and building ; Hull is interested in chemical industries, engineering, and aviation ; Coventry is concerned with automobile engineering and aviation ; Edinburgh with mining, engineering, building, and brewing ; Glasgow with shipbuilding ; Leicester with textiles, boot and shoe manufacture, printing, applied chemistry, and engineering ; Derby with artificial silk and motor engineering ; while Manchester is interested in engineering and building.

Consequently, in course of time, throughout the country, there will be established a series of special libraries of extraordinary value quite independent of the local city library, but as it is an age of specialisation, this is warranted. There will be a general agreement that the supply of literature for such a library would be : first, books

of popular works for general reading; secondly, books of general reference (these are costly, but most essential for students wishing to conduct research); thirdly, text books for students for instructive purposes and supplementing their notes supplied by the teaching staff. In addition to this, the weekly and monthly scientific and technical journals should be included, and, most important of all, the proceedings and transactions of the various professional institutions and societies. These could be supplemented by the various government publications and abstracts. Science abstracts will also be found of great value. All these volumes should be strongly and attractively bound and carefully catalogued. Under organised control, they could be borrowed by suitable students for short periods, but this condition cannot be applied to purely reference works.

The outlay for specialistic literature of this type, and annual reserve for repairs, binding and other library equipment, is bound to present difficulties with existing grants and in many cases would be prohibitive. Probably in this respect, the various professional institutions and societies could render considerable financial relief to technical college libraries by some practical demonstration of their appreciation of the technical college work. The unbound proceedings of these chartered bodies and societies are the privileged property of their various graded members; copies are issued in many instances to the general public at an annual cost approximating to that of a corporate membership subscription. In a good technical college, these publications, which are of such value, may comprise for instance, those of the Institution of Mechanical Engineers, Institution of Civil Engineers, Automobile Engineers, Marine Engineers, Structural Engineers, Institute of Fuel, Chemical Society, Institute of Chemistry, Textile Institute, Boot and Shoe Institute, The Royal Society, Physical Society, Institute of Physics, Institution of Chemical Engineers, and many others. Surely the Councils of these Institutions could find it possible to issue their publications at negligible cost or, indeed, free of cost to recognised technical colleges under certain agreed conditions. Several technical colleges already, through their educational schemes and National Certificates, receive recognition; let these institutions consider the influence of these certificates on their roll of membership.

Such a concession, involving with it trivial loss in publication sales, would be more than counterbalanced by the influential bearing of the technical college on its advanced students, both for the institution in particular and the country in general. Through the generosity and good will of members, teachers, and old students, some colleges have managed to maintain continuity in the publications, but it is a precarious basis on which to build a reference library.

As the Battersea Polytechnic is one of the very few institutions which have the good fortune to possess a first-class technical library, with funds to provide and maintain the library as well as to permit of the services of a librarian and assistant librarian, perhaps a short description would be a helpful guide to others wishing to seek an example of a typical technical library.

Irrespective of transactions and proceedings of societies and bound volumes of periodicals, there are 5,500 volumes, comprised as follows:

Mechanical and Civil Engineering and Building	503
Electrical Engineering	230
Mathematics and Mechanics	241
Physics and Photography	302
Chemistry	650
Hygiene and Physiology	332
Domestic Science	296
Education and Psychology	390
Art	152
Music	280
History and Geography	446
Social Science	191
General Literature	486
Biography	217
Poetry, Drama and Fiction	488
Dictionaries, etc.	108
Miscellaneous	140
TOTAL	5442

Each department of the Polytechnic has also a small departmental library. In addition to these, the Polytechnic preserves files of scientific and technical journals and transactions, for example :

ENGINEERING.

Automobile Engineer.
Electrician.
Electrical Review.
Engineer.
Engineering Abstracts.
General Electric Review.
Journal of the Institution of Electrical Engineers.
Proceedings of the Institution of Civil Engineers.
Proceedings of the Institution of Mechanical Engineers.
Transactions of the American Institute of Electrical Engineers.
Transactions of the Institute of Marine Engineers.

MATHEMATICS AND PHYSICS.

Mathemetical Gazette.
Nature.
Philosophical Magazine.
Philosophical Transactions of the Royal Society (Series A).
Proceedings of the Royal Society (Series A).
Science Progress.
Transactions of the Royal Society of Edinburgh.

CHEMISTRY (*Pure and Applied*).

Analyst.
Annalen der Chemie.
Berichte der Deutschen Chemischen Gesellschaft.
Biochemical Journal.
British Chemical Abstracts.
Cereal Chemistry.
Chemical Abstracts.
Chemical Review.
Faraday Society Trqnsactions.
Industrial and Engineering Chemistry.
Industrial Chemist.
Journal of the American Chemical Society.
Journal of the Chemical Society.
Journal of Physical Chemistry.
Journal of the Royal Society of Arts.
Journal of the Society of Chemical Industry.
Transactions of the American Institute of Chemical Engineers.
Transactions of the Institution of Chemical Engineers.

Besides the actual journals themselves, it is essential that the various decennial and other cumulative indexes to them be provided.

The library is arranged on the alcove system, the various alcoves being devoted to the different departments. For example, the first alcove contains the books on engineering ; the second the books on

mathematics, physics, and photography; others are allotted to chemistry; domestic science; hygiene, and so on.

Practically all the additions are now confined to works dealing with subjects coming within the curriculum of the college, and no book is placed in the library without, in the first instance, the request and approval of the head of the department concerned, and the sanction of the Principal.

The manner of selection of the books is as follows: Periodically the heads of departments, in consultation with their staff, submit a list of new books which would appear to be suitable to the needs of their students. In order that nothing may be inadvertently overlooked, the librarian brings to the notice of the heads of departments all likely books as they are published. Most of the books are first obtained on approval and, having been finally selected and purchased before being placed on the library shelves, they are submitted to the particular member of the teaching staff concerned in order that he may note or abstract such information as he may think necessary. It will, therefore, be seen that the teaching staff have a very intimate knowledge of the literature of their subject and thus are in a position either directly or through the close co-operation of the librarian to advise their students as to their reading. This scheme works admirably and most effectively. The co-operation of publishers in general, instead of that of a selected few, for the purchase of literature under special rates and conditions would enable a saving of funds towards extending the field of the library.

As I have already indicated, it cannot be too strongly emphasised that, for the best application to be made of the library, it is essential that it must be in the charge of a fully-trained and experienced librarian. Although he should be first and foremost a librarian, it is very desirable that he should have had some scientific training, and be sympathetic and agreeable in disposition. It is interesting to note in this connection that the University of London has recently instituted an alternative Diploma Course in Librarianship for Graduates in Faculties other than Arts. The librarian should be the holder of the Diploma in Librarianship either of the University of London or of the Library Association, and should, of course, be a full-time official and be given adequate assistance and also an adequate salary.

I do not think we can do better than quote from the above-mentioned book on "Reference Work":

> The first and chief item in the equipment of a reference department, its pivot, its focus, its keystone is the reference Librarian. A great library is not sufficient substitute for him, although it will multiply his effectiveness. An exceptional collection of reference material will largely live fallow without his fertilizing and productive powers. The library by itself can be understood, appreciated, and fully availed of only by the very few who know books and how to use them. Most people are not thoroughly at home with books, can not make the best possible use of library resources without informed guidance and expert help. It is useless to attempt reference service without a reference librarian.

By the nature of the qualifications to be sought in him, he should be placed on terms at least of equality with the graduate teaching staff. Co-operation of a most intimate character between heads of departments must be his constant concern and he must regard himself as the medium between departments and students in all matters relating to reference works.

As most of the students of a technical college will come from secondary schools having libraries of their own, they will probably have been given instruction in the use of books and libraries and so will have a good general idea as to what to expect to find in the college library and how to use it. But it should be arranged that all students should at least be

(*a*) Made familiar with the card catalogue and its arrangement ;
(*b*) Told of the principal periodical indexes and their location ;
(*c*) Shown the plan of the library and location of the various classes of books ;
(*d*) Given a list of current periodicals ; and
(*e*) Informed of the general rules of the library.

Instruction in the use of libraries is not nearly so thoroughly dealt with in this country as it is in the United States of America. In America there are several systems in vogue chiefly for use in school libraries. For example, a little pamphlet called "Find it Yourself" was recently published by the H. W. Wilson Company of New York, described as "a brief course on the use of books and libraries under the Contract System." This is probably familiar to most librarians present and need not receive detailed description here.

DISCUSSION.

In opening the discussion, Mr. B. M. Headicar said : I am sure we shall all be in general agreement with Principal O'Riordan's plea for adequate libraries in our technical colleges. Without these working tools the student is tremendously handicapped, but the point I want to emphasise is the urgent need for some scheme for teaching the student how to set about his research and how to make proper use of these working tools when provided ; how to familiarise himself with the catalogues and indexes in the library and how to make proper use of reference books which may be provided for his use.

What are the problems with which any serious student is faced when beginning a piece of research, what are the difficulties he has to contend with at the commencement of his task, and how should he meet them ? First of all, in selecting his problem he should endeavour to choose one which will make some difference when it is solved. He should investigate carefully whether the problem has been already solved, whether the ground has already been covered. Even if this is so, it may enable him to test his own conclusions and may give valuable suggestions regarding method, etc. It has to be remembered, however, that many theses depend for their acceptance for degrees upon the fact that they deal with matters not covered, at any rate in the same way, by other writers. Within my own experience recently there have been cases where publication of work has been seriously hindered by the fact that a similar work was already on the market and years of valuable time proved to have been largely wasted.

The problem having been selected, the student should seek the criticism of experts upon his decision. Their opinions should receive the fullest consideration and respect. This further step having been decided, the method of procedure should be carefully outlined. Comparisons with other work should depend upon the data used being really comparable. It is essential to differentiate clearly between fact and opinion. If the work is done under limitations, such should be clearly pointed out and possible inaccuracies stated. Quotations should be literal and exact, and should be from an original source and not from other people's versions of them. I remember asking the author of a well-known work on railway matters where I could see a work from which a quotation has been used in furtherance of an argument, and whether the work was in the British Museum Library. He replied that he had not seen the original work and did not know where it could be seen. The quotation had been extracted from the work of another writer ! It transpired that the translation omitted an important negative which altered entirely the application of the argument. How often, one wonders, is this the case ? The work of any writer dependent on such methods for his reputed facts must inevitably be discredited. It is extremely important that the student should

understand the elements of practical bibliography. Many an important work is reduced in value because the bibliography it contains is nothing more than a list of names and titles, without date, origination, or even place of publication. The student needs to be told that there is a certain minimum of information which every bibliography should contain if it is to be of any real service. The unfortunate researcher located far from any library resources needs instruction in regard to the collection of material for and by himself. He has to depend on correspondence largely, on personal visits, on newspapers and reviews, plus any small number of books he is able to purchase or to borrow from friends. He needs to be told that his correspondence, his notes, his clippings, will require systematic arrangement and classification if they are to be available at a moment's notice. He must decide to keep his letters and pamphlets in boxes or drop-cases ; his clippings must be mounted on Lixum guards in folders, or, if in great quantities, perhaps in large envelopes and duly classified. He must be persuaded to keep a stock of note-books, one for each division of his particular subject, or to make up his notes on cards, tied together in classified order, or kept in card cabinets, or even cardboard shoe boxes in an emergency. These he can get for nothing at the local boot shop. Should he be one of the fortunate majority who have a library at their disposal, he will require instruction in the use of bibliographies, in the elementary rules of cataloguing and classification. He cannot expect to find quickly the resources of his library unless he is aware that " de Lessefs " is entered under L and " de Morgan " under D. He should be made familiar with alphabetical arrangement, and its elementary rule, " Something follows nothing." He should not only know of the existence of the " Statesman's Year Book," but should be told that he will find in it the best general bibliographies of the various countries of the world, as well as tables of the world's production of sugar and gold for a long period of years. The existence of the various indexes to periodicals and their methods of arrangement are essential matters, as well as the indexes to government publications, frequently compiled on quite different lines, and which may form the fundamental bases of his bibliography. These are only some of the things which, once understood, will save years of his life. It is my argument that instruction on these lines is a necessity for every student, that the librarian is the only person who can give this instruction accurately and thoroughly. It is a matter for the immediate attention of ASLIB and the School of Librarianship that systematic instruction should be available to students and teachers on all these points. It is in my opinion essential that every library of an educational institution should be one worthy of the place, and that every librarian should be given the opportunity to instruct the students as a body on the methods of cataloguing and book arrangement, the bibliographical tools, etc., within his library. In such a way the work of research is made immeasurably lighter, and the status of the library and the librarian becomes more fully realised and appreciated.

Mr. B. C. Curling said : With reference to Mr. O'Riordan's suggestion that the leading professional institutions should present or supply at a nominal charge to the technical colleges copies of their Transactions, to be placed in the college libraries for the use of students, the Chairman opportunely reminded us of the present financial stringency and its incidence upon the professional institutions. I wholly agree with Mr. O'Riordan's proposal, but venture also to point out that students who have reached the stage at which they find the transactions of the professional institutions of value to them are in most cases eligible for admission to the appropriate institutions as student members, on payment of very nominal fees, in return for which, *inter alia*, they would be supplied direct with the transactions mentioned. For instance, quoting the case of my own Institute (of which, I may add, Mr. O'Riordan is a valued member) a student or apprentice engineer who satisfied the requirements of the regulations can be admitted to the junior membership on payment of 10s. entrance fee and an annual subscription of 5s. only, for which he receives the complete transactions of the Institute the same as a full member. When I add that the bare cost per member of producing the transactions is several times the fee above-mentioned, it will be seen that the Institute does already subsidise the college student to a material extent, and the Council trust that this concession will increasingly conduce to the college authorities and lecturers influencing their students to associate themselves at an early age with the professional institutions which represent the special branches of industry for which they are preparing.

Mr. H. Rottenburg said : I should like to put forward two definitions—namely, of education and training—which I have found useful in discussing them.

[*Contd. on p.* 111

Suggestions for the Improvement of Scientific and Technical Literature.

By T. W. MacALPINE.

Throughout the last twenty years the writer has made a practice of examining most of the treatises published in English on mathematics, physics, and kindred subjects, and has given much consideration to the form and style of exposition, letterpress, illustrations and diagrams, appearing in the books.

Of the many new treatises published every year on each of these sciences there are not a few which seem to contribute little or nothing to the literature of the subject, for they contain practically no new matter and, moreover, are often inferior in exposition and general treatment when compared with earlier works.

Criticism of New Books mainly Negative.

New and important treatises on scientific subjects and new editions of existing books are generally reviewed in scientific journals and, occasionally, in other sections of the press, but criticism, especially where it takes the form of disagreement with the work, is usually of a negative character and often directed only to the pointing out of errors.

Of course, criticism of this kind is necessary, but the critic rarely goes on to indicate the form and treatment desirable for the subject in the work under review.

The Genesis of New Scientific Books.

Before proceeding to discuss means by which suggestions of this kind could be advantageously given, it may be well to consider what has been the practice to date in regard to the genesis of new scientific books :—

(*a*) The manager of a publishing company concludes that there is need for a new work, or a new edition of an existing one, on some section of science. How has he formed this opinion ? He has received, or heard of, many inquiries for a treatise on the subject in question, or it has been suggested to him that there is room for a new work on this branch of knowledge ; and if he decide to proceed with the project, he looks about for an author to write the book.

(*b*) On the other hand, a specialist may approach a publisher with a completed manuscript on his particular subject.

(*c*) A specialist may suggest to a publisher that he would be willing to write a book on his subject, providing the latter gave him a commission to do so.

Now, whichever of these may occur and whatever the financial arrangements made between author and publisher, the decision as to the course to be followed rests finally with the directors and manager of the publishing company, though expert opinion from

sources outside and independent of the company may be called in to advise.

Then the final decision, should it be favourable to the project, must be followed by a more minute consideration of the form of treatment, size of volume, type, number of words, number and kind of illustrations and diagrams, paper, binding, etc.

It may be that in regard to some of these points, the author is unable to furnish information of much assistance to the publisher, hence, the utility of the book may be determined largely by the limitations of the latter's experience.

And on other occasions as they arise, this same manager may be required to sift the evidence in favour of publishing a book on one of the many branches of mathematics, physics, geology, botany, a section of English, or foreign, literature, or a treatise on a branch of medicine, etc., etc.

In short, his duties may bring him into touch with any subject in the whole range of knowledge and learning, but it is expected of him in every case that he shall be competent to make a final decision on the several points mentioned above.

Does this practice make for efficiency in any one of these very large subjects ?

It is suggested here that, as an alternative procedure, it would be of great benefit to those for whom the books are written, whether specialist, teacher or student, if some independent body of recognized standing in the world of science would furnish authors and publishers with information and guidance on the points which appear under *a* to *n* below.

Scientific and technical literature can be divided into three large groups :—

A. Books, treatises, monographs, tracts, and theses, on scientific and technical subjects.
B. Scientific journals.
C. Proceedings, transactions, brochures, and pamphlets, issued by scientific and technical societies.

The Conditions it is Desirable to fulfil.

The remarks about to be set down under *a* to *n* are made with four main objects in view :—

(1) To improve the exposition of the subjects of which the books, journals, etc., treat.
(2) To increase their general utility for quick and easy reference.
(3) To reduce the cost of their production.
(4) To facilitate their storing and filing.

If these ends are to be attained it is necessary that :—

(*a*) Authors and publishers should have fuller information as to form of treatment, style of exposition, kind of diagrams and degree of illustration, desirable in a treatise or text-book on a given subject, which is intended for the use of specialist, teacher or student, or for reference purposes (1) (2) (3).

(*b*) Authors and learned societies should have fuller information as to particulars in (*a*) desirable in a paper, etc., on a given subject, which is intended for reading and discussion during

a meeting and to be published subsequently in the proceedings of the society, or in pamphlet form, for reference purposes (1) (2) (3).

(*c*) There could be more uniformity in nomenclature and symbolism. (1) (2) (3).

(*d*) Legible and clear type should be selected (2).

(*e*) Different type faces could be used to convey distinctions in signification, (1) due regard, however, being paid to (*f*).

(*f*) The variety of type faces for letterpress and formulæ and also for titles and subtitles of chapters and subsections, contents list and index, should be restricted to a minimum (3).

(*g*) There could be a more suitable selection of kinds (line, halftone, etc.) of diagrams and illustrations and sizes thereof. (1) (3).

(*h*) There needs to be more detailed subdivision of each book, article, and paper, etc., into chapters, sections and subsections, with suitable titles and subtitles, etc. (1) (2).

(*i*) The practice of numbering the paragraphs in the chapters, sections and subsections should be adopted (2).

(*k*) A synopsis of contents might appear at head of each chapter, section or paper, in agreement with titles of subsections and numbering of subsection paragraphs (1) (2).

(*l*) The contents list and index to book, proceedings, etc., ought to be compiled to enable quick reference to details of letterpress and illustrations (2).

(*m*) There needs to be more restriction in the variety of size (height and width) of page and in the size and shape of the volume (3) (4).

(*n*) There should be more restriction in the variety of size (height and width) of printed area on page (4).

It is suggested then, that the general utility, economics of publishing, and convenience of storing and filing, of books, journals, etc., would be greatly increased the larger the number of authors, publishers, and learned societies, adopting a uniform system in regard to sections *a* to *n* above.

The Advisory Body.

It remains to consider whether there is an independent body of recognised standing in the world of science that could furnish authors and publishers with information and guidance on some, or all, of the points *a.* to *n.*

Scientific literature is surely the principal medium through which science is advanced.

It may be mentioned in passing that the advisory body must have no vested interests in publishing business.

In the first place, it has been shown in the foregoing paragraphs that it is necessary for the author and desirable for the publisher to be in possession of accurate information as to the requirements of the users of the treatises that are projected.

Now, what is needed is a central body which numbers on its membership roll most of the leading scientists, professors and teachers of science throughout the British Empire and, moreover, one that is closely related in a working union to all scientific societies; it

follows that a body of this constitution can collect the required information from all sources with thoroughness and fullness.

Then, again, a few professors and teachers write treatises which they recommend to their classes and pupils as the books most suitable for the curriculum; and these writers could also be invited to collaborate with, and advise, the central body as to the qualities desirable in the books on the subject in which they specialize.

If the above-mentioned proposals were put in operation the advice and guidance of the central body would appear in the form of comprehensive and general suggestions dealing with the several points discussed in *a.* to *n.* above, which mainly determine the character of the scientific treatise, journal, etc.

It is clear that this information and guidance could not restrict in any way the liberty of action of authors and publishers, but, on the contrary, the latter must benefit by the advice of a body which is at the very centre of the scientific world and whose opinions based, as they are, on wide and deep knowledge of the subjects in question, must carry great force.

After a survey of the field had been completed the work of the advisory body should not be heavy, for there would be no difficulty in keeping abreast of the requirements of scientific literature for the purposes considered here.

DISCUSSION.

In the absence of Mr. MacAlpine, his paper was presented by the CHAIRMAN (MR. L. D. GOLDSMITH). He doubted whether any scientific body in existence could undertake the task proposed by the author. Probably five per cent. of the scientific and technical books now published would suffice, and those worth publishing fell under three heads: (1) New and original work to be published in scientific journals or in book form according to its length; (2) collation or compilation of scattered existing knowledge; (3) central treatment of work already published, sometimes overlapping with (2). He referred to the disadvantages of combined text and reference books. He thought there was an increasing field for the small monograph dealing with specialised parts of scientific and technical subjects.

MR. ROTTENBURG supported this view, and a resolution was passed by the meeting for submission to the Council (see Report of Final Session, page 98).

CAPTAIN C. W. HUME spoke of the advantages to students of being able to compare several text-books dealing with the same subject, and of the literary defects, with consequent difficulty in understanding, in the writings of research workers.

MR. H. H. JOHNSON, DR. S. C. BRADFORD, MR. L. C. WHARTON, MR. G. F. H. SMITH, MR. FOSTER SPROXTON, MR. E. N. SIMONS, DR. A. L. SHEATHER, and MR. H. L. JACKSON also took part in the discussion.

Organisation of the German Information Service on Technical Literature.

By ALFRED SCHLOMANN,
on behalf of the Deutscher Verband Technisch-Wissenschaftlicher Vereine.

To widen their knowledge and to keep abreast of the achievements of science and engineering, German engineers, more particularly those among them who are engaged on scientific work or on the application of the results of scientific research, avail themselves of the information contained in scientific books and periodicals. Moreover, both scientists and practical men are wont to study, not only the works of contemporaneous literature as far as they apply to their work, but also those of the past, in order to retrace the connections with earlier work and to glean from their perusal hints helpful to their own work. Such return to the literature of past periods often prevents the pursuance of objects which were attained already in the days gone by—some of them completely, others in part—but were dropped again and fell into oblivion because the progress of engineering went past them. To consult the work of earlier days and to build up on it is necessary, not the least in order to prevent the same work being done over again.

The conviction, current in Germany, that it is necessary, also in the realm of scientific work, to proceed economically and to avoid repetition of work already accomplished and rather use it as a basis to start from, has created in the German scientist and in the practical man the habit of consulting the literature of all languages in which successful scientific or engineering work is recorded.

This mental attitude of the men of applied science has resulted in considerable activity being developed in the field of literary reference service (journal of abstracts), and, in this connection, mention may be made of such periodicals as " Chemisches Zentralblatt," " Technische Zeitschriftenschau," " Zentralblatt der Hütten- und Walzwerke," and " Technische Schriftenschau des Archivs des Landesmaschinenwesens."

These journals of abstracts are records of most diligent literary studies, which, for reasons of a sensible division of labour, are undertaken in Germany by various bodies which are especially qualified for this work. However necessary the journals of abstracts may be, however useful for many institutes and industrial firms as well as for the creative minds, they can do no more than give cross-sections, as it were, repeated from time to time, of the whole body of literature relating to a certain sphere of knowledge. The information gleaned from these journals will remain incomplete so long as it is not registered in a card index extending back over a long period and kept up-to-date continually. The journal of abstracts in a few pregnant words calls attention to the fact that a notable literary production belonging to a certain sphere of knowledge has appeared. As far as space available,

funds, and time permit, it records all articles, books, etc., that are published concerning a certain subject, without, however, critically valuing it or even suggesting any valuation.

For many years, records have been kept, by the central organisations of German scientific and economic associations and by various industrial firms, of the literary productions relating to certain branches of engineering. Some of these records, which are similar in character to the journals of abstracts, include the entirety of such productions, while others are of selective character. They are available to enquirers subject to their personal position and to their character as members of those associations or firms. One can understand this reservation, which is practised by these information departments chiefly with the idea of precluding misuse. Thus, however, it was not possible for everyone to make use of these institutions existing in Germany. For this reason, the demand has been voiced recurrently for something like thirty years, and often in public, that a central service be created which is to answer enquiries concerning any subject dealt with in the whole of present and past engineering literature. It must be pointed out here that engineering literature is understood in Germany to include, not only books and technical periodicals, but also patent literature and the journals published by industrial firms, which are of a high order of scientific and practical merit, as well as the special publications and propaganda literature issued by these firms. For it is a characteristic feature of the development that has taken place in Germany during the last twenty years that scientific research work is being carried out, not only by universities and technical colleges, but also in the private laboratories of industrial firms. Accordingly, an information service which disregards the publications of the latter, would be inadequate and fall short of its purpose, at least in as far as German technical literature is concerned.

In Germany, the fact has often been pointed to, that, beyond the information contained in literature and in the abstracts published in the journals, there is an abundant source of technical information hid in the brains of those men who are engaged either on creative work or on the compilation of the material for the journals of abstracts. Moreover, it was recognised at an early date in Germany that the scientific libraries have a greater task than merely to lend out books and to index the titles of books and periodicals, seeing that just the librarians possess a valuable knowledge, which can be made available to the enquirer only in personal intercourse. In making this statement, we wish to do full justice to the importance of the co-operation of the scientific libraries, but not to overrate it. A fairly long period of collaboration with them will be needed in order to lift the large treasure of knowledge accumulated in them.

Thanks to the division of labour adopted in all spheres of knowledge in Germany, it was possible, on the 8th of November, 1929, to proceed to the creation of the Information Service Organisation looked forward to so long. In the course of the extensive preparatory work, which, through several years, was devoted to enlisting the co-operation of all the existing information departments belonging to the different sections of engineering, it became apparent that the only possible and practicable way to organise the central information service was that of adopting a de-centralised system of work. The

preparatory work as well as the final organisation of the German Information Service was undertaken by the Deutscher Verband Technisch-Wissenschaftlicher Vereine (German Association of Engineering and Scientific Societies) in Berlin, which is a central body uniting the most important engineering and scientific societies of Germany for the purpose of taking care of their common interests. At the Deutscher Verband Technisch-Wissenschaftlicher Vereine, there is a Committee on Technical Literature, which has to deal with all large problems common to the whole of engineering literature, as far as they require a fundamental solution on the basis of mutual agreement. This Committee ascertained that over 100 different organisations for information on sources of literature belonging to various individual sections of engineering existed in Germany for many years.

The information departments co-operating to-day with the Central Service are subdivided according to sections of engineering as follows :

Section.	*Number of Departments.*
Whole of engineering	8
Fundamental sciences, natural science (including chemistry)	8
Agriculture, food, engineering	8
Mining and metallurgy	5
Materials and working of materials	6
Power	18
Traffic (including means of transit)	11
Civil engineering (including sanitary engineering)	9
Special industries (textile, leather, glass, etc.)	11
Management, administration, standardisation	12

Grouped according to their character and connection with other bodies, there are :

Public Information Services :	
Ministries	5
Research and Testing Institutes	9
State and University Libraries	4
Technical College Libraries	7
Technical High Schools	3
Private Information Services :	
Scientific Societies and Associations	19
Industrial Associations	9
Industrial Firms	25
Research Institutes	6
Individuals	9

The newly-created " Vermittlungsstelle für den Technisch-Wissenschaftlichen Quellennachweis (Agency for Information on Sources of Scientific and Engineering Literature) at the Deutscher Verband Technisch-Wissenschaftlicher Vereine has been organised as an independent and neutral central body (Clearing House) in such a way that it co-operates with the existing information departments without interfering with their independence or individual development. Enquiries received by the Agency are forwarded to the

sectional information departments best qualified to deal with them, and the latter communicate with the enquirer direct, the Agency serving the common cause without all personal ambition.

By virtue of this decentralised organisation of the information service, large expenses are avoided, while prompt and satisfactory action is ensured. The sphere of action of the Agency has in no way been restricted. All enquirers, whether from home or abroad, are handled in the same way. It is intended later on to approach similar institutions in foreign countries with a view to establishing a large international information service on sources of scientific and engineering literature.

In conclusion, we wish to point out that a central agency which would have to handle the information service quite independently and relying completely on its own resources, would assume proportions as regards office space and staff required, such as would make of it a utopian thing.

This consideration has induced all persons, institutes, and societies interested in the organisation of the Central Agency to support the proposal to leave the actual giving of the information in the hands of those bodies that have been doing it up to now. Thus, the newly founded Central Agency represents merely an organisatory measure for the systematic co-ordination of the existing individual information departments : apart from the service to enquirers, it has to clear, to begin with, quite generally the problem of engineering information service and to see that it is given widest publicity.

DISCUSSION.

Dr. R. S. Hutton presented Herr Alfred Schlomann's paper.

Dr. G. Freitag, Director of the Deutscher Verband Technisch-Wissenschaftlicher Vereine, said : On behalf of the German Union of Technical-Scientific Associations and especially on behalf of Herr Schlomann, I wish to thank Dr. Hutton heartily for his excellent presentation of the paper contributed by Herr Schlomann.

The German Central Technical Information Service is, as you have heard, very similar in constitution to ASLIB.

Originally our plans were quite different. In 1916, when our Union was founded in Berlin, we intended to establish a large Central Technical Library, which should include all important technical books and periodicals, etc., etc., with an adequate staff to deal with all technical enquiries. The inflation period in Germany upset this ambitious plan, but the demand for such an information service becomes greater from year to year. Consequently, the original plan has been reconsidered and modified. It was finally decided to establish a central organisation to provide a clearing-house for the individual specialised information bureaux of the numerous technical societies, institutions, and industrial undertakings, linked up with the scheme. Thus the provision of the information itself was left to the special expert bodies. Already, after one year's experience, all are agreed this new plan is the right one. This scheme avoids the great expense and the great difficulty of providing a huge collection of literature and an expert staff competent to deal with the diverse branches of technical science. It also avoids duplicating staff and literature already available in the individual constituent bodies. More especially it is felt that the present method is preferable, in that it enables the enquiries to be dealt with by experts, who are in constant touch with the progress of each special branch. Centralisation would have withdrawn expert staff from immediate daily contact with the actual technical progress in each special division of our interests. The success of our enterprise is shown by the growth in the number of bodies associating themselves with our central technical information service. The number of 100 mentioned in Herr Schlomann's paper has already grown to over 120.

We are very glad to know that you in England now have a flourishing clearing-house for information in ASLIB, and we should appreciate close co-operation with ASLIB and its members in the future.

The Present Position of the Movement in Germany for the Standardizing of the Forms of Books and Periodicals and of Library Methods with reference to its wider Interest and International Importance.

By Dr. PRINZHORN.

At the centre of all library activities there lie problems, material and abstract, of order and method. Owing to the extraordinary increase in printed output these problems have, in recent years, grown increasingly pressing and complicated.

A distinct advance has been made, by the recognition of the importance of standardisation and classification, for the solving of these problems. To bring together, in Germany, all those interested in these questions, the Standards Committee for Libraries, Books and Periodicals was, in 1927, formed as a branch of the German Standards Committee. No large programme was adopted, but, in the first place, the most urgent problems were taken in hand. I now refer to such of this work, and to the results, as may claim to be of general interest.

I. The Form of Periodicals.

A uniform size and shape for periodicals has been chosen to conform with the standardized sizes for paper. During the last ten years, these standards for paper have been used in Germany in all matters relating to registration and shares, and also this now applies to about forty per cent. of business letters and forms.

Sheet A.4* (210mm. by 297mm. or $8\frac{1}{4}$in. by $11\frac{3}{4}$in.) adopted for business letters, has been selected as the standard size for periodicals. Following on the uniformity of the pages, the space for the printed matter is also standardized.

Transference of articles from one journal to another is thus rendered easy. The standard for the printed matter fixes the size of blocks, and to advertisers this gives the convenience that any standard block will serve for any standardized periodical.

And finally, standardization effects a saving on production costs. Standardization is of special importance to librarians, as journals of uniform size can be easily handled and arranged, and there is no difficulty in assembling copies of separate periodicals. 500-600 periodicals in Germany are now published in standard form. These are mostly technical and trade journals. Although, with the non-technical press, the appreciation of the advantages of standardization makes slower progress, the movement towards standardization is constant. The approval by the Standardizing Committees of Belgium, Holland, Norway, Austria, Poland, Russia, Sweden, Switzerland, Czechoslovakia and Hungary gives the possibility of the standardization

* Specimens of the forms referred to in this paper may be seen at the ASLIB offices.

of periodicals in these countries. It would, perhaps, be worth the trouble, if the countries which have not adopted the metric system would investigate whether it is possible to reach agreement on the adoption of a standard, in *any* form.

I may add a few words about the origin of the standards for paper. About twenty years ago, Wilhelm Ostwald laid down the basic principles for standardization. These were improved by Porstmann, who took as basis for the standards an original sheet, one square metre in size, with the proportions of the sides so chosen that, by repeated halving, a series of standards was obtained, these having the same ratios of the sides as those of the mother form. The repeated halving of the mother form gave a so-called series " A " from which the standard form of letter sheets and periodicals is taken. A perfect and logical solution of the problem of standardization has been obtained.

A further advance has been made towards the most suitable form for periodicals by the introduction of the so-called order of reference margins. On the bottom margin of the cover of each issue there is to be given, in a settled sequence, all the data necessary for a clear description of the journal, together with the citation or abbreviated title. The suggestion for the citation margin, made in 1928, has met with approval and wide acceptance. It has already been adopted by most of the technical journals in Germany.

Propaganda for the adoption of citation margins has hitherto not been possible, pending the international settlement of title abbreviations. This important question will also have an early solution.

The German proposal for international uniformity in abbreviations of titles of periodicals was in close agreement with the schemes of " The World List of Scientific Periodicals " and was, in December of last year, discussed at a meeting of the International Institute for Intellectual Co-operation. There was a happy decision about the regulations. In one important point these depart from the usual practice in technical circles of giving the shortened reference by the initial letters only of the words of the title. The spreading of this latter method would be fatal. There would be an extraordinary increase in the number of periodicals which librarians would not be able to distinguish or recognise. As there are, to-day, tens of thousands of technical journals, the abbreviated titles must give clear and correct information. It is of special importance that the full title of a periodical can be readily reconstructed from the abbreviated title.

It is a pity that, in technical circles, there is an increasing tendency to use, in references to technical periodicals, abbreviations in which only the initial letters of the words are used.

The German and English proposal seeks the solution of the problem by the adoption of a middle course, and this may be the only right way. After the issuing of the international rules, the various scientific groups will publish separate lists of international reference titles. Further, the reference title of each periodical will be printed on each issue, in the reference margin, in the manner already referred to. With this it may be that all that is practicable will have been done for uniformity in references.

It will, of course, also be necessary to take steps to obtain the co-operation of publishers and editors.

The sequence of the references must be fixed, as if this is done the designations—volume, number, page, etc.—need not be given. Further, there will shortly be issued proposals for standardization on right lines, of the details in the make-up of scientific journals, and these will cover all outstanding points. It will, for example, be laid down that Roman numerals are not to be used for the numbering of volumes and parts ; that numbers be also given for the first page of new parts and to the commencing page of each article ; that the list of contents of each part be printed on one of the four sides of the cover, or on a separate contents slip (it is not easy to find a list of contents printed at the end of the text, or hidden in the advertisement columns) ; that in the table of contents the titles of separate articles be given in column form ; that, in reference books and bibliographies, complete works be distinguished from articles appearing in journals, by a special mark, as, for instance, by a thick point in front of the title, and so on.

The lives of librarians and of those engaged in research work would undoubtedly be brightened by the adoption of these proposals.

II. Standardisation of forms for use in Library Work.

All these forms are being subjected to close examination. Forms which are being tested and standardised are :

(1) Forms required for general administration.
(2) Forms relating to acquisitions by purchase, gift or exchange and to temporary withdrawals.
(3) Forms relating to periodicals.
(4) Forms relating to the reading and lending services.
(5) Forms relating to cataloguing, book-binding, and to statistics.

The work of preparing a uniform and most suitable lending slip is in hand.

For the future, the most important problem is the standardization of the book card. Book cards are now sent out in increasing numbers by publishers, either with, or in place of, prospectuses. If every publisher would supply the so-called book cards with his books, the work of librarians would be appreciably lightened. It would no longer be necessary to write or print the titles of books on slips of paper. But the first step to be taken in the solving of this problem is the settlement of the form and size of the cards and the position of the printed matter on these. Up to now the card proposed is of form A.6, that of the international postcard, which has been taken into favour in business circles. But as the international library form cannot be passed over, the only remaining possibility is either, in this instance, to depart from standard, or to adopt the nearest smaller form, A.7, which differs only by one mm. in height from the international library standard form.

It is likely that in Germany there will be agreement on the adoption of form A.7. In connection with this there is another important matter. In recent years many periodicals have supplied so-called contents slips, which are suitable for filing. It is obvious that these slips should be of the same size and shape as the book cards. Different forms are now used by various publishers of periodicals.

It is further important that the divisions of the headings are in accordance with standard regulations. There are at present so many

discrepancies that it is not possible to assemble in the same card cabinet the forms which may be of identical size, but which are issued by different publishers.

The final object of standardization would be in view if the decimal numbers were also printed on these book cards and slips.

III. Decimal Classification.

One of the greatest problems is that of uniform classification. With this the only choice is that of decimal classification, as the international acceptance of this system makes it the easiest method. The Brussels edition is now being translated into German. The translations for nearly all the technical branches are now ready in manuscript form.

By the adoption of decimal classification in libraries, catalogues, bibliographies, etc., the work of librarians and library users will be much lightened.

Further important work on standardizing which will shortly be taken in hand comprises :—

(1) Uniformity in the rules for the transcription of foreign, and more especially of Slavic, languages.
(2) Standardization of the sizes and shapes of books.
(3) Standardization in the arrangement of libraries and stores.

Nearly all the problems referred to are of international interest. They are not peculiar to any single country.

The greater the number working on the solution of these problems, by so much the greater will be the benefit to librarians and to the users of libraries. We cannot evade these problems, as the appalling increase of literary output has thrown all of us into difficulties that can be overcome only by combined effort and by the adoption of the latest method of systematization and standardization.

DISCUSSION.

Dr. Prinzhorn's paper was presented by Dr. R. S. Hutton.

Mr. Norman Parley, explaining the position in this country with regard to sheet sizes, said that the adoption of the standards referred to by the author would create no difficulty so far as paper making was concerned. A size of 8¾in. by 11¼in. meant a sheet of 34in. by 48in., which fitted in with the 90in. to 120in. width of most of our book paper machines. But there would be very great difficulty with printing where hundreds of thousands of pounds worth of plant was in use, mainly in the sizes 30in. by 40in. (Crown), 35in. by 45in. (Demy), 40in. by 50in. (Royal), and 60in. by 40in. (Crown). The Demy machines could not print the sheet required by the German size, while the next larger British size—40in. by 50in.—is comparatively little in use.

Mr. L. C. Wharton and Mr. L. D. Goldsmith also spoke.

Final Session.

At the final session of the Conference the chair was taken by Dr. R. S. Hutton. Before the formal business was taken Mr. J. G. Crowther spoke for a short time on "Science in Soviet Russia." If it had been possible the delegates would have kept Mr. Crowther until a late hour questioning him on what he had seen and the opinions he had formed during his visit to Russia.

Dr. Hutton announced that two resolutions had been received for submission to the General Session. If these were approved they would be passed to the Council for consideration and necessary action. The resolutions having been moved and seconded, it was agreed to refer them to the Council. The resolutions were as follows :

1. This conference, recognising the vital need for training students in the efficient use of libraries, urges university and other education authorities to consider the organisation of systematic instruction in this subject in all faculties.

An addition to this resolution was accepted to the effect that in each educational institution the librarian should give an annual lecture, to be attended by all new students, dealing with the library and its uses. A recommendation that the resolution should be forwarded to the Association of Technical Institutions and the Association of Principals in Technical Institutions was noted.

2. That there appears to be a distinct demand for small monographs on specialised subjects ; that publishers should therefore be asked to produce these in large numbers and to devise suitable means for binding them, and that they should take all possible steps to bring them, when published, to the attention of scientists, technicians, and scientific workers.

On the proposal of Dr. R. S. Hutton, the best thanks of the Conference were offered to the Warden and Fellows of New College for their permission to hold the Conference there. Votes of thanks were passed also to the Junior Bursar and the College staff, to the institutes and individuals who had provided facilities for visits, and to the authors of papers and the chairmen of meetings.

The proceedings of the Conference then ended.

Report of the Fifth Annual General Meeting.

The Fifth Annual General Meeting (third since incorporation) of Members and Associate Members was held at 5.30 p.m. on Saturday, September 20th, 1930, at New College, Oxford.

Present : Fifty-eight Members and Associate Members were present.

Chairman : Brigadier-General Magnus Mowat (Chairman of the Council of the Association) acted as chairman of the meeting.

ITEM 1.

The minutes of the Fourth Meeting, having been circulated, were taken as read. It was agreed that they should be confirmed and signed as correct by the Chairman.

ITEM 2.

The audited Statement of Accounts had been circulated. On the motion of GENERAL MOWAT, seconded by MR. SHAW SCOTT, they were accepted.

ITEM 3.

On the motion of MR. O'RIORDAN, seconded by MR. RIDDLE, it was resolved unanimously that Messrs. West and Drake be re-appointed auditors to the Association. MR. BESTERMAN suggested, for the consideration of the Council, the possibility of a qualified member of the Association being appointed honorary auditor.

ITEM 4.

The CHAIRMAN referred to the deaths of five members of the Association : Gascoigne T. Calvert, J. H. Costain, C. G. Ashton Jonson, L. Norrgren, and C. C. Wharton.

The SECRETARY read the list of members (which had been circulated) who had accepted nominations to serve on the Council of the Association. As the number of nominations did not exceed the number provided for in the Articles of Association, it was resolved unanimously, on the motion of MR. J. W. H. BROWN, seconded by MR. C. A. SPENCER, that the Council be elected as follows :

Brigadier-General Magnus Mowat, C.B.E., M.Inst.C.E., M.I.Mech.E., Institution of Mechanical Engineers.
Miss A. L. Lawrence, M.B.E., M.A., LL.B., British Medical Association.
H. W. Acomb, M.A., National Liberal Club.
A. Brammer, Association of Supervising Electrical Engineers.
T. Besterman, Society for Psychical Research.
F. B. Bourdillon, C.B.E., Royal Institute of International Affairs.
J. J. Eaton, *The Yorkshire Post.*
A. P. M. Fleming, C.B.E., M.Sc., M.I.E.E., Metropolitan-Vickers Electrical Co., Ltd.
H. Vincent Garrett, Rowntree and Co., Ltd.
B. M. Headicar, F.L.A., London School of Economics and Political Science.
F. A. Hoare, National Union of Teachers.
C. E. Hobbes, International University Society.
J. E. Hodgson, Royal Aeronautical Society.
L. Honeyburn, Imperial Chemical Industries, Ltd.
Miss D. W. Hughes, Career Advisory Bureau and " Journal of Careers."

R. S. Hutton, D.Sc. (Director, British Non-Ferrous Metals Research Association).
Colonel E. L. Johnson.
Miss C. S. Lowry, M.A., Agricultural Economics Research Institute.
Colonel Sir Henry G. Lyons, D.Sc., F.R.S., The Science Museum.
F. C. Mitchell, London Press Exchange, Ltd.
Lieut.-Colonel J. M. Mitchell, O.B.E., M.C., M.A., Carnegie United Kingdom Trust.
Colonel Sir Frederic Nathan, K.B.E.
Lieut.-Colonel L. Newcombe, T.D., F.L.A., National Central Library.
Albert Parker, Management Research Groups.
J. G. Pearce, M.Sc., M.I.E.E., British Cast Iron Research Association.
A. F. Ridley, F.L.A., British Non-Ferrous Metals Research Association.
J. C. Stobart, British Broadcasting Corporation.
A. P. Thurston, M.B.E., D.Sc., F.R.Ae.S., M.I.A.E.
G. B. Willey, A.R.S.M., F.I.C., Hadfields, Ltd. (Research Department).
J. C. Withers, Ph.D., British Cotton Industry Research Association.

On the motion of General Mowat, seconded by Dr. R. S. Hutton, a vote of thanks was passed to the retiring members of the Council: Mr. J. W. H. Brown, Mr. F. W. Clifford, Mr. Percy Cohen, Mr. E. Wyndham Hulme, Mr. P. K. Turner, and Major L. F. Urwick.

Item 5.

On the motion of General Mowat, Mr. H. T. Tizard was elected President of the Association by acclamation, and a vote of thanks was passed to the retiring President, Sir J. J. Thomson.

Item 6.

On the motion of Sir Frederic Nathan, seconded by Miss D. W. Hughes, Miss A. L. Lawrence was elected Honorary Secretary of the Association.

Item 7.

On the motion of Mr. J. G. Pearce, seconded by Dr. R. S. Hutton, Brigadier-General Magnus Mowat was elected Hon. Treasurer of the Association.

Item 8.

In a short discussion, in which many members took part, several points of detail were mentioned: the cost of printing the report and its form, the arrangements regarding conference meetings, the reporting of discussions, and the treatment of conference resolutions. The Secretary made notes of the various suggestions put forward.

This concluded the business of the meeting.

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX.

INCOME AND EXPENDITURE ACCOUNT for the YEAR ENDED 30th JUNE, 1930.

Dr. EXPENDITURE. Cr. INCOME.

EXPENDITURE	£ s. d.	£ s. d.	INCOME	£ s. d.	£ s. d.
To General Expenditure			By General Receipts—		
Salaries	743 12 4		Membership Subscriptions	693 4 4	
Rent, Light, and 'Phone	142 19 6		Donations	2 0 0	
Insurance	2 18 10		Bank Interest	16 9 6	
Printing, Stationery, Postage, and Office Expenses	143 0 2				711 15 10
Reference Books	5 18 2		„ Conference Receipts—		
Travelling Expenses	23 16 8		Fees and other Receipts	387 6 1	
Subscriptions	1 6 0		Sale of Reports	17 13 6	
Press Cuttings	2 2 0		Advertisements in Report	27 1 6	
Audit Fee	6 6 0				432 1 1
Income Tax	3 6 0		„ Translators' Registration Fees		16 16 0
Depreciation of Furniture and Fittings	5 2 10				
		1080 8 6	„ Balance, being Excess of Expenditure over Income for the Year, carried to Balance Sheet		437 10 6
„ Cost of 1929 Conference—					
Conference Expenses	307 10 0				
Printing of Conference Report	187 15 10				
		495 5 10			
„ Expenses *re* Translators' Panel		22 9 1			
		£1598 3 5			£1598 3 5

BALANCE SHEET - 30th JUNE, 1930.

Dr.

LIABILITIES.	£ s. d.	£ s. d.
To Sundry Creditors		14 3 1
„ Subscriptions in Advance		19 18 0
„ Directory Reserve—		
As at 30th June, 1929	336 8 10	
Sales to 30th June, 1930	41 12 8	
	378 1 6	
Less Transferred to Working Capital	150 0 0	
		228 1 6
„ Working Capital—		
As at 30th June, 1929	479 0 9	
Less Balance of Income and Expenditure Account	437 10 6	
	41 10 3	
Add Transferred from Directory Reserve Account	150 0 0	
		191 10 3
		£453 12 10

Cr.

ASSETS.	£ s. d.	£ s. d.
By Cash at Bank on Deposit Account	300 0 0	
„ Cash at Bank on Current Account	94 7 7	
„ Cash in Hand	4 1 10	
		398 9 5
„ Sundry Debtors for Directories and Reports sold and Advertisements in Reports		8 18 0
„ Furniture and Fittings—		
As at 30th June, 1929	51 8 3	
Less Depreciation at 10 per cent. p.a.	5 2 10	
		46 5 5
		£453 12 10

We have audited the above Balance Sheet and have obtained all the information and explanations we required. In our opinion such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the Association's affairs according to the best of our information and the explanations given to us and as shewn by the books of the Association.

July 18th, 1930.

8, New Court, Lincoln's Inn, London, W.C.2.
and at 16, Market Place, Reading.

(Signed) West and Drake, *Chartered Accountants.*

(Signed) Magnus Mowat, *Chairman and Hon. Treasurer.*

*The Association of Special Libraries and Information Bureaux (ASLIB) and its work.

By COLONEL SIR FREDERIC NATHAN.

Lord Balfour, in an address delivered shortly before his death, remarked that, whilst the sum of human knowledge continuously grows, human faculty remains constant. There could be no more concise statement of the problem with which everyone interested in ASLIB is actively concerned, and it has two most important primary features. In the first place, it is a modern problem. Our last President, Sir Joseph Thomson, the great physicist, in his address at the sixth conference of the Association, recalled the time, within his own experience, when it was perfectly easy for a professor of physics to read and even to possess everything that had been written on that subject. If he attempted that task to-day he would have to abandon his own researches, his teaching, and his leisure, and, in the end, the mass of material pouring out in an ever-increasing stream would overwhelm and defeat him. No matter to what subject one turns the position is the same. In every field—science, industry, trade, commerce, education, etc.—the information available in the world is so great, so scattered, so rapidly increasing that it is beyond the power of the individual to bring within his own knowledge even that small portion of it that deals with his special subject. Not only has the information grown, but modern conditions make it necessary for the individual to be familiar with a greater proportion of what is available. The merchant whose operations were confined, a century ago, to the area served by a local market town must now be equipped with the facts about market conditions all over the world. The builder must have knowledge of the uses of a hundred kinds of material where, previously, he would have been called upon to employ only a dozen.

The reasons for this tremendous change are of great historical interest, but there is not time to consider them here, where we are concerned with practical efforts to meet the new situation. These practical efforts must be addressed to the fact that all this knowledge has to be highly organised for individual use, if advantage is to be gained from it.

The second primary feature of the problem is that, struggling in its toils though they be, there are very few people who are able to see it as a whole; who have realised the conception expressed in the late Lord Balfour's statement. The result is that the efforts to deal with it are sporadic, sectional, planned narrowly, and on too small a scale. Co-ordination is lacking and, too often, the attempts are themselves the cause of additional confusion. Methods are not unified and work is duplicated.

All this was in the minds of those who, in 1924, convened the conference at which the Association of Special Libraries and Information Bureaux was formed. The credit for this conference must be given to a number of men actively engaged in work of scientific and

* An address delivered at the Conference of the International Institute of Bibliography, at Zurich, August, 1930.

industrial research. They organised the meetings in order that those engaged in the collection, treatment, and dissemination of information in many departments of human activity should have an opportunity of discussing certain common problems. They had, at that time, no intention whatsoever of forming a permanent association. In his introductory address, Dr. R. S. Hutton, Director of the British Non-Ferrous Metals Research Association, and now Vice-Chairman of ASLIB, remarks, " Heaven forbid the formation of a new society . . ." In England there is, indeed, a bewildering multiplicity of societies existing for the furtherance of as great a variety of objects. Undoubtedly their efforts overlap in many places, and Dr. Hutton's reluctance to add to their number was understandable. The fact that, in spite of the intentions of Dr. Hutton and his colleagues, ASLIB was formed as permanent body, with a governing council, officials, staff, and offices in London, in the course of the next twelve months is an indication of the strength of the need and the purpose which is behind it. The promoters of the original Conference did not create a new unnecessary organisation ; the organisation forced itself upon the promoters.

I will quote from the printed prospectus of the Association.

The objects of the Association are : To examine, foster, and co-ordinate the activities of research organisations, special libraries, information bureaux, and similar services ; to act as a directing agency to these sources ; to develop the usefulness and efficiency of special libraries and information bureaux under whatever titles they may function ; to promote, whether by conferences, meetings, or other means, the wider dissemination and the systematic collection and use of information ; to encourage, by co-operative means, the prevention of waste of effort due to the unnecessary duplication of the work of those engaged in research and allied services.

It achieves its objects by :

(1) Maintaining a record of the whereabouts and the particulars of existing sources of information and in assisting its members to get into touch with them.

(2) An annual conference in September, at which papers on all aspects of organised information services are presented and discussed both formally and informally, and at which personal touch is established between members. Members are entitled to attend at a special reduced fee, and to receive the Proceedings free.

(3) The issue of a Directory of sources of specialised information in Great Britain and Northern Ireland. It is supplied to members at half price—*i.e.*, 10s. 6d.

(4) The issue free to members of a Quarterly Bulletin of information in which the Directory is kept up to date.

(5) Advising and assisting its members in the organisation and classification of their own records.

(6) The establishment and maintenance of a register of expert translators—*i.e.*, of translators who possess not only languages, but the specialised knowledge of the subjects which is essential for work of a technical character. The register is free for the use of members.

That is the accepted official statement of ASLIB's objects and work. It has the virtue that it is brief and comprehensive, but it speaks in terms so general that it somewhat fails to convey what the Association has actually done and what it is actually doing. For instance, you speak to a merchant of " the organisation of business information," and you assume that he will grasp the implications of the phrase. That is a mistake. In fact, he does not appreciate that the organisation of business information is something which will assist him materially in the difficulties which he experiences, for example, in obtaining reliable, up-to-date statistics showing the imports of certain goods into South America. You speak to a chemist of " the wider dissemination of information," and he does not realise that here is something which might overcome the difficulty he has in discovering the contents of Russian technical journals.

I do not wish to make that mistake, and I cannot do better than to abandon generalisations and give you, briefly, some account of the actual things which ASLIB has accomplished and which are engaging its attention now.

In September every year ASLIB has a week-end conference, held in one of the Colleges at Oxford or Cambridge. There are usually 150 to 200 people present, living together for those few days like university students. There is a pleasant absence of formality about the proceedings. Indeed, it is often said that the impromptu discussions which arise amongst groups of delegates at meals and in their rooms at night are of greater value than the pre-arranged meetings. A most important thing about the ASLIB Conference is that the delegates attending reflect the great diversity of activity and interest which is to be found in the ASLIB membership. That membership comprises individual workers in many fields, government departments, learned societies, scientific and industrial research organisations, business concerns, educational bodies, public librarians, librarians of specialist libraries, publishers, etc. Now, as a rule, conferences are arranged for well-defined groups of people. The naval architects have a conference at which they meet other naval architects, the art masters confer with their fellows at another conference. That is all quite right and useful. But at an ASLIB conference like does not meet like. A teacher meets a publisher, and they have a talk regarding school text-books which is most informative to both. A chemist meets an agriculturalist. The latter finds that the former's researches into gases may be the means of solving his problem of dealing with a pest. I could give you instances where such conjunctions as these have had results of great material importance.

The meetings at the conferences are of two kinds. There are those which deal with various aspects of the technique of the special librarian or information officer, classification and indexing and their applications, abstracting, the training of personnel for information work, and so forth. And there are those which are intended to illustrate the need for the uses of organised information in every sphere. The particular subject is not of great importance ; it may be agricultural research, or printing, or aeronautics. Each year an endeavour is made to show the application of the ASLIB idea to fresh matters and thus to gain the interest of new groups. To give a rather extreme case : at the forthcoming conference a meeting is to be devoted to animal

welfare. I hope that the members of ASLIB are at least as humane and civilised as others, but the Association, as such, has no concern with the welfare of animals. But those who are active in this particular cause are pursuing a serious purpose, and we propose to show that, like every other one, it is entirely dependent upon organised information that their activities must be placed on a firm basis of ascertained facts, and that, without a systematic service of the relevant specialised information, their efforts must fail. In short, we use animal welfare, and a great variety of other subjects, as a peg on which to hang the thing which matters to us as an Association, the organisation of information. We are guilty and unashamed of using subjects of wide public interest in order to draw attention to our own objects.

Each year the Proceedings of the Conference are printed and published in a report. There are now six of these volumes, and their combined contents form a valuable collection of material relating to information and bibliographical work. The Association also publishes for its members, a quarterly bulletin, " ASLIB Information," containing matters of current interest, and keeping members informed of the activities of their Association.

One practical outcome of the conference is that, after discussion of a subject, it is not unusual for the delegates to pass resolutions calling upon the Council of the Association to take measures to put their decisions into effect. I shall refer, in a few minutes, to some of the things which have been done as the result, but first I must say something about a publication of which many of your will have heard, the ASLIB Directory.

The founders of the Association were fully aware of one great obstacle which stood in the way of the fuller utilisation of the specialised information in existence, the fact that very few people knew, or possessed easy means to ascertain, what sources of information, in special libraries, information bureaux, and elsewhere, were available. And therefore the first big task undertaken by the Association was the compilation and publication of a guide to these sources in Great Britain and Ireland. In this task the Association received generous financial assistance from the Carnegie United Kingdom Trustees, and the Directory was completed and published two years ago.

The ASLIB Directory is a volume of about 450 pages. The material in the first part of the book is arranged alphabetically under subjects, and there are about 1,500 subject-headings, under which there are references to over 2,000 sources of information. Opening the book at random I find on one page the following subject-heading : Heating and Ventilation, Hebrew Language and Literature, Hemp, Heraldry, Herbals, Herbs, Heredity, Hides and Skins, History ; and on another : Wireless, Witchcraft and Women. In the second part of the book the names of the towns where the sources of information are situated are arranged in alphabetical order, with a note of the conditions under which access to each is obtainable. I think I am correct in saying that this publication is unique in the world, and the Association has received ample evidence of the great value it has been to students, research workers, and others.

Not all the data obtained as to sources of specialised information could, for various reasons, be published in the Directory, which can be referred to at every important public library, and which can be

purchased by any member of the public. The Association's private records, maintained on cards, are therefore even more comprehensive than the Directory itself, and since the book was published a considerable amount of new and additional material has been collected. All this supplementary information is available to members of the Association through its Enquiry Bureau. The service performed by this Bureau is to tell members where they can obtain special information on every possible subject. If a members' enquiry cannot be answered by reference to the records of the Bureau it undertakes to discover the whereabouts of the information needed, if it exists. In this work it is aided very much by the diversity of the Association's membership, upon the great aggregate knowledge of which the Bureau is enabled to draw. The Bureau has been called upon to deal with some very out-of-the-way enquiries indeed, and, if it fails to discover some wanted information, there is a fair assumption that the information does not exist.

I have mentioned the activities of the Association which arise from conference resolutions, but those are not the only incentives to action, which may be initiated by the Council of the Association, or be suggested by a difficulty to which a member draws attention, or by a statement noticed in the press. We believe that the organisation of information is a thing of too much importance to exaggerate. The Council and officials of the Association are constantly on the alert to apply that idea to every problem of human activity. The work to be done is endless, the amount of work which the Association undertakes is limited only by the means at its disposal. Here are a few as examples—I cannot do more than name them—of the things with which the Association has concerned itself, often, it can be claimed, with effect: the union catalogue of London libraries, the establishment of the National Central Library, the reform of the Patent Law, the indexing of periodicals, the standardisation of the page size of journals, the durability of paper, bibliographical details in publishers' catalogues, abstracting services, preservation of documents of historical value, and many others. Three matters I will say a few words about.

Within the last few weeks, after careful consideration by a special committee, the Association has put into operation its scheme for the registration of expert translators. The attention of the Council of the Association had been continually drawn to the difficulty often experienced in finding translators for pieces of work which require both the necessary linguistic qualifications and a knowledge of the special work concerned. As an example, a man is not qualified to render into English an article in German, dealing with wireless telegraphy, unless he is proficient and possesses knowledge of the subject and familiarity with the technical terminology concerned in both languages. The intention is that the register shall include the names of a great many translators so equipped and that it shall cover a great range of languages and subjects so that it shall be capable of meeting any demand that may be made of it. The Association will act as intermediary. The client who requires expert assistance will state his needs and he will be provided with the name of a translator qualified to fulfil them. If he is a member of the Association he will enjoy that service without charge; non-members will have to pay a

fee for each name given. It is too early to say whether the scheme will meet with success. It was announced only recently and, already, a great number of enquiries have been received and a great number of applications from translators who wish to be registered.

A second recent achievement of the Association was referred to at a recent meeting of its Council, who were then formally notified that, following upon representations made by ASLIB, the Senate of the University of London had passed a scheme for the provision of a one year's intensive course of training for special librarians. This is the successful culmination of prolonged efforts on the part of the Council and some members of the Association, who realised that the university training available for those intending to become librarians was, in several ways, unsuitable for " special " librarianship where a special technique of informational work is required. The Association believes that there is no surer way of attaining its objects than by making certain that posts in special libraries and information bureaux are filled by properly trained men and women. The right training is now available, and the efforts of the Association will be directed to ensure that the new facilities are used and that employers generally recognise the importance of obtaining trained personnel for their libraries and information departments.

The last piece of work of ASLIB which I propose to mention relates to classification or indexing. At its conferences ASLIB has provided a platform for the discussion of classification systems and their application, and, not infrequently, its Enquiry Bureau has been called upon to advise and assist members with regard to their problems of classification. But, until recently, the Association, as a body, did not advocate the adoption of any particular system. The Council of the Association came to the conclusion, however, that the time had come for ASLIB to abandon this detached attitude and to include amongst its definite objects the realisation of uniformity in bibliographical methods. They felt that the assumption of a positive attitude in regard to this matter would give point and vitality to much of its work and would indicate definite lines of action in several matters to which only desultory attention had been given previously. The pursuit of uniformity inevitably involved that ASLIB must become the advocate of a particular classification system and, accordingly, the Council appointed a special committee to consider and report upon the matter.

In that report the Committee stated, at the outset, that they had in mind particularly the uses of classification in connection with the maintenance and exchange of records of specialised information. They came to the unanimous conclusion that ASLIB should adopt the Universal Decimal Classification of the Institut International de Bibliographie. They gave in detail the reasons which induced them to prefer that system. They proceeded to make recommendations as to the active steps which ASLIB should take in the matter. The Council of the Association adopted the Committee's report and its recommendations have been followed. Not the least important point emphasised in the report was that in this matter ASLIB must seek the co-operation of the British Society for International Bibliography. Needless to say, that was appreciated, and the first thing that ASLIB Council did was to establish a Joint Committee of the

two bodies with Professor A. Pollard and Dr. Bradford representing the B.S.I.B. and with Colonel Newcombe, librarian of the National Central Library, and myself representing ASLIB. The Joint Committee has held its first meeting and has, as a preliminary, set in motion machinery to make a survey of the existing position as regards classification in Great Britain and other English-speaking countries. I think you will share my own view that this conjunction of ASLIB and the B.S.I.B. is an important gain for the cause of international bibliography.

In conclusion I want to say one thing more about the general problem with which ASLIB is striving to deal. If that problem is to be understood and, without understanding the steps taken to deal with it are abortive, it must be realised that it has two distinct parts. One part consists of the provision of mechanism for making information available. To grasp what that implies is to be appalled by the magnitude and the difficulty of the task. But it is small and easy as compared with the other part of the problem, which consists of the fact that not one person in a hundred is persuaded that the organisation of information is important. The vast majority is indifferent. That means that the work of a body like ASLIB must, to a large extent, be of a propagandist nature. It has not only to promote a service, but to persuade people that they need that service. You will agree with me that there remains plenty for ASLIB to do.

*Fourth Report on the "Commission Internationale de la Classification Decimale."

By F. DONKER DUYVIS,
Honorary Secretary.

Mr. Donker Duyvis's preceding reports have appeared in the ASLIB Annual Conference Reports and in "ASLIB Information." Together they form a connected account of the progress of work on the Universal Decimal Classification. The present report gives particulars of developments during the past year. The preparation of the alphabetical index is proceeding, but, because of restricted means, slowly, and lack of funds continues to hamper the classification as it has always done. New extensions, enough for a thirty-two page supplement, are ready, but there is no money to meet the cost of publication. Mr. Duyvis's own words regarding the financial position are as follows: "Again I must ask the conference to consider seriously how funds may be placed at the disposal of the secretariat of the committee. It may be observed that the scientific work for the preparation of the new edition and the further work for the committee on decimal classification has been done with no other material help than the typewriting work, which had been carried out by the staff of the Dutch Institute of Documentation, whilst the postage stamps and writing paper have been paid by the same Institute. Also in one case translation work was paid when I could not find an 'honorary' translator. Travelling expenses, etc., have been paid by the various collaborators and editors themselves. Although the publication of the work practically without means had the charm of a sport, I should like to be a little less handicapped, when a next edition is to be published. I think that the work would have succeeded better if we had possessed a regular clerical staff of our own and that, for example, a lot of printing mistakes in the new manual could have been avoided, if we could only have afforded to make more proofs and could have paid professional correctors."

The thing about this statement which will strike those who know how tremendous an achievement is the preparation and publication of the classification is its moderation and its modesty.

After giving information about the work done in each country, in translating the classification and in assisting in its correction and extension, and the progress made in regard to its adoption, the report proceeds to discuss, at length, the principles involved in methods of extension and modification. Consideration is given also to the evolutionary development of the tables, with illustrations showing how the 1905 and 1928 editions differ, and how, where necessary, the changes have been brought about by means of what is called the "starvation" system.

The next section of the report is most interesting, but rather to the student of the theory of classification than to the practitioner

* There is printed here only a very brief summary of the report. The full report may be obtained from the ASLIB offices.

who is making daily use of the Universal Decimal Classification for his immediate purposes, for it deals with the possibility of a complete revision of the tables down to the ten original divisions. Mr. Duyvis concludes this section with the remark : " In order not to discourage too much those who believe that the decimal classification is standardised for ever, I want to observe that such a revolution is not likely to take place before thirty or fifty years."

Then there follow some notes dealing with technical difficulties which arise—*e.g.*, where punching card devices are employed, and where the classification number exceeds six figures, and making suggestions as to how such difficulties may be overcome.

Finally, the matter of concordance with the American Dewey Decimal Classification is considered, and this is of special importance to the many public libraries in this country where the Dewey system, or some modification of it, is employed. The necessity for this concordance has been emphasised by the decision to add decimal numbers to the Library of Congress cards. A good deal has been done already towards this concordance, those concerned in Europe and America are in touch with one another, and finally no doubt the differences between the two systems will very largely, if not entirely, disappear. In the meantime Mr. Duyvis points out that the existing discrepancies are not, for practical purposes, so serious as might appear. A small or medium-sized general library catalogue would give the same numbers, in most divisions, whether the Dewey or the Universal Decimal Classification was used. It is when the systems are employed for bibliographies and special work that the differences become serious.

Contd. from p. 85]

Education is the art of producing an attitude of mind, while training is the art of producing an aptitude of mind. These definitions bring out the apparent similarity of the two.

Mr. Headicar wants students taught to make bibliographies. More important, it seems to me, is the making of abstracts or précis. The précis is really the verbal statement of what one must remember of an article or chapter in order to reproduce it, and making précis teaches the student to put his memory in order.

Mr. Headicar also suggests, as a preliminary to research, the collecting of information of what has been done. It seems to me that it is better first to plan out exactly what is to be covered by the research and how it is to be done and then find what has been done. Henry Ford destroys all records of research in order to prevent later workers being prevented doing a piece of work because it has been done before. The discovery by Ramsay or Argon resulted from research on the constituents of the air, a thing that had been done many times before.

Others taking part in the discussion were Councillor C. R. Keene, Mr. H. M. Cashmore, Mr. R. Brightman, Dr. E. A. Baker, Mr. H. Farr, Mr. A. B. Hyslop, Mr. H. W. Acomb, Mr. L. R. McColvin, Dr. R. S. Hutton, Colonel L. Newcombe, Dr. A. P. Thurston, Mr. W. L. Cooper, and Mr. J. McAdam.

At the end of the discussion a resolution was passed (see page 98).

Index

NOTE.—This is not a complete subject index to the contents of the papers, but only to the names of speakers and the titles of papers, etc. Copies of the six previous Reports can be obtained from the offices of the Association.

PAGE.

Alphabetical Subject Index, Inadequacy of 39
Animal Welfare, its Dependence on Accurate Information . . 31
ASLIB :
Annual Accounts 101, 102
ASLIB and its Work 103
Bulletin 18
Directory 17
Enquiry Bureau 17
Report of Annual General Meeting 99
Report of Year's Work 15
Translators Panel 18

Barbour, W. 53
Bather, Dr. F. A. 27
Besterman, Theodore 52
Bonser, Dr. W. 52
Books and Periodicals, Standardizing form of 94
Bradford, Dr. S. C. 39, 54
Bremner, D. A. 55

Classification, Report on Universal Decimal 110
Crowther, J. G. 98
Curling, B. C. 85

Display of Scientific and Technical Objects 24
Dissemination of Information 24
Durability of Paper 21
Duyvis, F. Donker 52, 110

Education for Salesmanship 20

Fagg, C. C. 71
Freitag, Dr. G. 56, 93

German Information Service on Technical Literature . . . 90
Germany, Standardizing in 94
Goldsmith, L. D. 52, 89
Gray, C. H. 55

Headicar, B. M. 84
Hume, Captain C. W. 31, 89
Hutton, Dr. R. S. 93, 97, 98

Inadequacy of the Alphabetical Subject Index 39
Information, Dependence of Animal Welfare on Accurate . . 31
Information, Dissemination of 24
Information, Organised, Relation of Surveys and Planning to . 57
Information Service, German, on Technical Literature . . 90
Information, Technique of in Training of Students . . . 77

PAGE.

Journals, Page size of 21

Librarians, Training of Special 19
Library Association 17
Lyons, Colonel Sir Henry 24

MacAlpine, T. W. 86
Marsh, L. C. 64
Mowat, Brigadier-General Magnus 15
Museum Curator, Experience of 27

Nathan, Colonel Sir Frederic 53, 103
National Central Library 20
New Survey of London Life and Labour 64

Organisation of the German Information Service in Technical Literature 90
O'Riordan, G. F. 77

Page Size of Journals 21
Panel of Expert Translators 18
Paper, Durability of 21
Parley, Norman 97
Pepler, G. L. 57
Pollard, Professor A. F. C. 39, 53, 54, 70
Prinzhorn, Dr. 94

Regional Survey as Pure Research 71
Rottenburg, H. 52, 89, 111

Salesmanship, Education for 20
Schlomann, Alfred 90
Scientific and Technical Literature, Suggestions for Improvement of 86
Scientific and Technical Objects, Display of 24
Special Librarians, Training of 19
Spencer, C. A. 55
Students, Technique of Information in Training of 77
Subject Index, Inadequacy of Alphabetical 39
Suggestions for the Improvement of Scientific and Technical Literature 86
Surveys and Planning, Relation to Organised Information . . 57

Technical Institutions and Libraries 77
Technical Literature, German Information Service on . . . 90
Technique of Information in Training of Students . . . 77
Tizard, H. T. 13, 52
Town and Regional Planning 57
Training of Special Librarians 19
Translators, Panel of Expert 18

Universal Decimal Classification, Report on 110
Unwin, Raymond 76

Walker, J. M. 30
Wharton, L. C. 52
World Power Conference 55

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